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MARCH 2001

NATIONAL GEOGRAPHIC

Ancient Tombs of Peru

Pre-Inca
Treasures 58

Indonesia

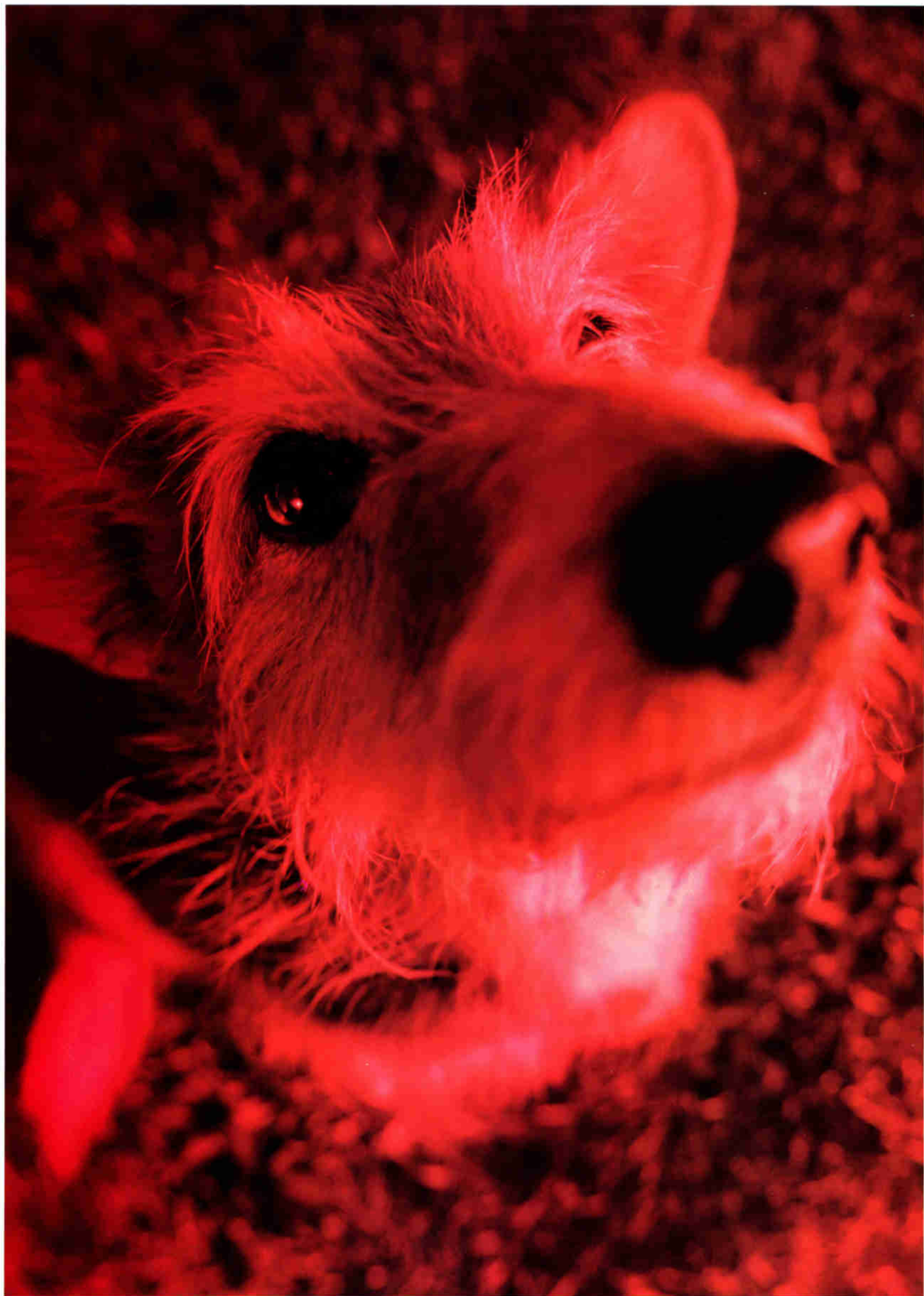
Living
Dangerously 74

America's Pioneer Naturalist

Legacy of
William Bartram 104

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THE COVER

An orphaned mandrill is kept as a pet—or perhaps as a future meal—by the hunters who killed his mother.

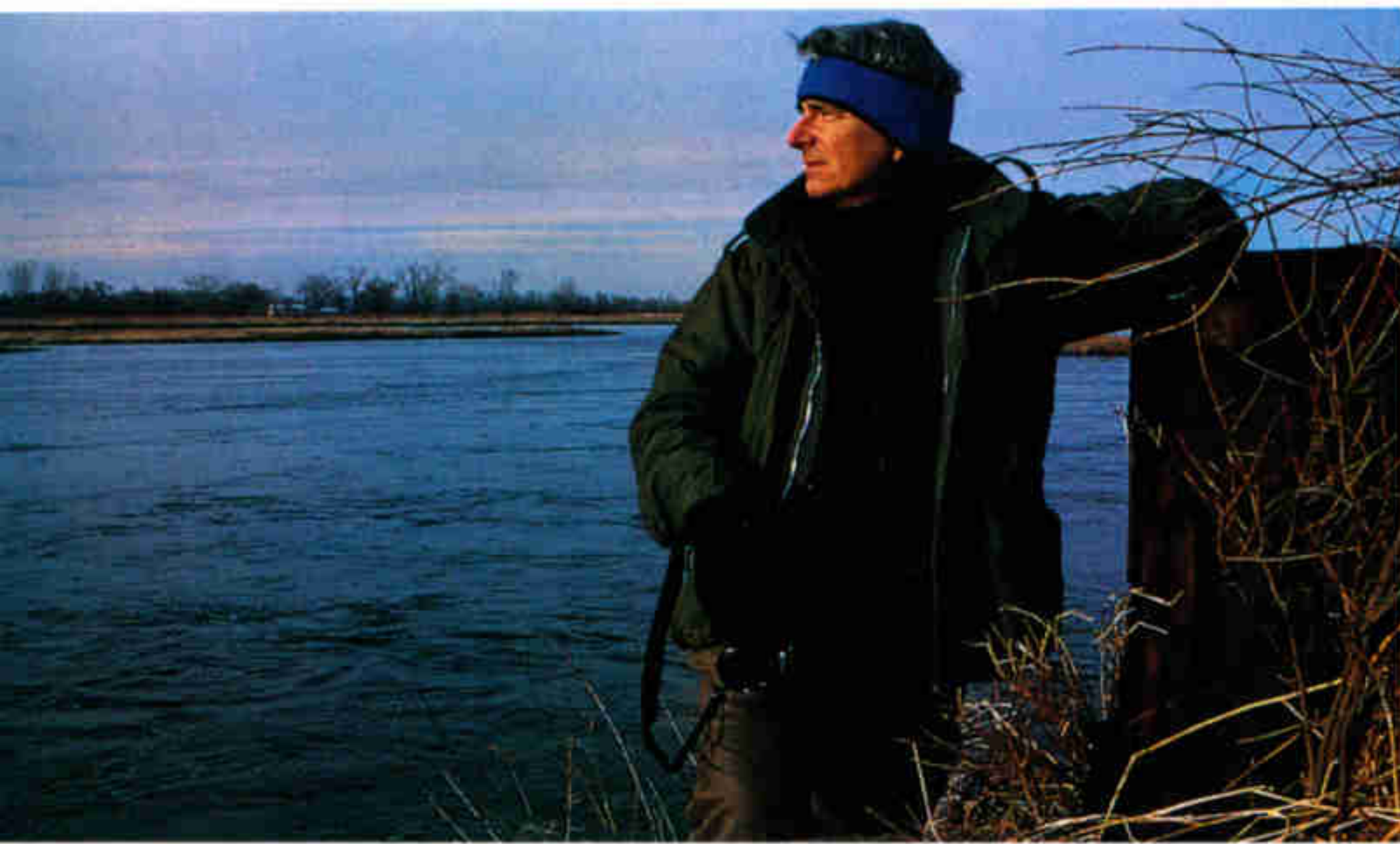
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From the Editor



JOEL SARTORE

How cold was it? If I were a comedian, I could probably come up with some smart remark here. All I can say is that the sandhill cranes just had to be warmer than photographer Joel Sartore and I were. At least they could move around and talk to each other. We hardly dared a whisper while photographing their migration stopover along the freezing Platte River in Nebraska.

William Bartram was certainly warmer as he trudged through frontier Florida and came upon sandhill cranes. He described them as “sonorous.” Well, OK. Listen for yourself to what I recorded by visiting our website at nationalgeographic.com/ngm/0103. To me the great clouds of the blue-gray birds and the haunting sounds evoked a time long before humans threatened such scenes.

Conservation groups, farmers along the Platte, and political leaders in Nebraska have united to double the 14,000 acres of habitat already preserved for half a million cranes and some 20 million other migratory birds on their journey to northern nesting grounds. We owe them our thanks and our encouragement. This springtime passage provides one of the great sights and sounds of nature. Dedication to conservation has combined with plain economic benefit, created by the millions of dollars visitors bring to the area, to make it likely that this scene will continue for future generations to see, hear, and feel.

Bill Allen

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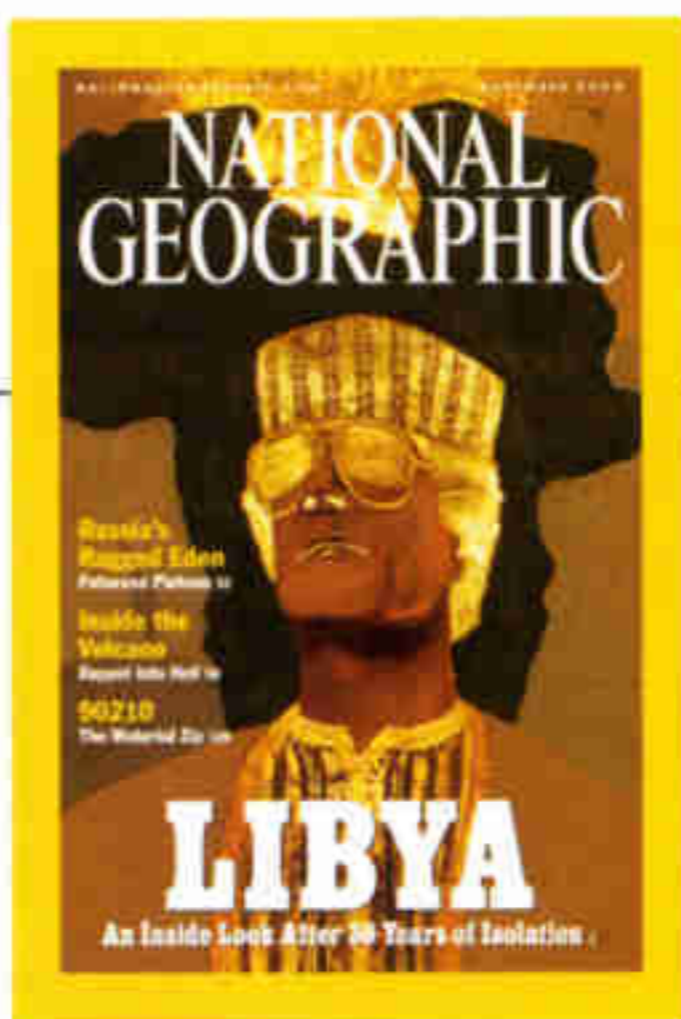
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Forum

November 2000

Our articles often elicit wildly divergent responses, as this selection illustrates, but there was no disagreement about the subject of "The Art of Being Luis Marden." Fond recollections poured in about the man who "so delighted in chronicling every nuance of the world." Confessed one reader of the story: "I picked it up, closed my office door, and spent the next hour diving in search of the Bounty."



Libya

It was a pleasure to see a well-balanced piece on Libya and Muammar Qaddafi. For many years now I have felt that media in the West were giving him a bad rap; he is an intelligent man trying to drag a medieval, feudal country into the 21st century. His views on women and their rights are especially enlightened for an Islamic leader of an Arab country. It is time to give him the credit he deserves.

LISE ALPER
Englewood, Colorado

To feature Muammar Qaddafi on the cover of NATIONAL GEOGRAPHIC, to use one of his glorified egocentric wall portraits in which he appears as a golden emperor, has elevated this terrorist enemy of the United States to a position of respect and power that he does not deserve.

MARLON S. PIKE
Southfield, Michigan

On pages 4 and 5 the caption states: "Islamic tradition permits one eye to show from a robe worn by a woman." This is inaccurate. Nothing in Islamic law requires women to cover their entire body except for "one eye." Islam requires both men and women to dress modestly.

Women must cover their hair, a requirement called *hijab*. They are not required to cover their faces at all. If it is required in the Tripoli airport, it is because of Libyan culture and customs.

HESHAM A. HASSABALLA
Villa Park, Illinois

We referred to a tradition among some Libyan Muslims, not to Islamic law. As you point out, it is not a custom of Islam generally.

I spent almost three years in Libya in the early '80s. I was struck by the entrenched method of using one's connections to get anything done. One needed them to get anything from evaporated milk to an exit visa. Another curiosity was that it was very difficult for a Libyan to be an ordinary laborer. It seemed everyone had to have a title or be a *mowdeer* (boss) of something, even if it was paper clips. Last, and most important, the Libyans were not radical. They were friendly, peaceful people who should not be judged by the actions of their government.

DAVID WHEELER
Niagara Falls, Ontario

I was at Wheelus Air Base in Libya when Qaddafi took over. I could imagine that he brought



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Nepal

My only criticism of this otherwise excellent report is the reference to Gurkha soldiers within the British Army as “mercenaries.” While the use of this word may be technically correct, it belies the true relationship that the Gurkhas have with Britain. The Royal Gurkha Rifles continue to be part of the British Army and have served with unswerving loyalty and courage for almost 200 years. They have been awarded 26 Victoria Crosses, the highest British military decoration. To describe these men as mercenaries is an insult.

MALCOLM HAYES
West Midlands, England

I was disappointed that your article gives the impression

that Dr. Ruit is the only eye surgeon in Nepal who performs contemporary surgical techniques for the poorest of the poor in that country. He is an excellent surgeon and is certainly concerned for his people. But the Nepal Eye Hospital, the Lions Eye Care Centre, the ophthalmic department of Tribhuvan University, and Foundation Eye Care Himalaya, as well as the Fred Hollows Foundation’s Tilganga Eye Centre, are all doing fantastic work in the field of eye care.

HAROLD R. COWIE
Calgary, Alberta

I am hoping that you have an explanation for the severed cow’s head in the photograph on page 103. I can assure you



MAGGIE STEBER

that no Hindu in his right mind would consider it less than a revolting spectacle.

MONICA BHATTACHARYA
Montreal, Quebec

The picture includes heads from goats and a buffalo but not a cow. The animals were sacrificed during Dasain, a festival honoring the goddess Durga’s victory over the buffalo-headed demon, Mahisasura.

a bolt of lightning to any negotiations. My attitude soured over the years because of Libya’s role in international terrorism, but your article has renewed my hope that Qaddafi and Libya have gained wisdom and understanding that only time and experience can bring. I believe that he can still play a significant role in molding the future of the Middle East.

PHIL HOLLENBECK
Seneca Falls, New York

Your story presented for the first time a three-dimensional image of Qaddafi. I am surprised to learn that he has made equality

of women a major cause. His Great Man-Made River seems to have succeeded when similar projects elsewhere might have failed. I also saw hints of Qaddafi’s humanity—his fondness for puns and wordplay. But he is still a figure whose reputation inspires fear. Any leader whose visage is an omnipresent feature of the national landscape should be approached with caution.

CHRISTINA C. SHANKAR
Chesnut Ridge, New York

ZipUSA: Beverly Hills

I was appalled and disgusted with the lifestyle depicted in the article on Beverly Hills. A representative Beverly Hills family has an annual income that is 15 times that of my family. Then I reread the article on Nepal, and I realized I make about 142 times what the average Nepalese makes. A humbling experience.

ROBERT HAGER
Paso Robles, California

I am thrilled by the way Mrs. Walters slammed Missouri in the article—no decent place to eat or shop in the whole state. What a shame. Please keep up the good work. The fewer people encouraged to live in the Midwest, the better for us chickens.

BONNY HEPP
Red Bud, Illinois

How ironic that you cite your journalistic balance in obtaining access to Libya’s Qaddafi [From the Editor]. Beverly Hills, the city I grew up in, is deserving of a Ken Burns documentary, not the *Saturday Night Live* approach you used.

PETER BELANGER
Van Nuys, California

Talk about a contrast in value systems! Let me see, either I buy a Gucci bowl and bed for my dog in Beverly Hills for \$2,250, or I could send the money to Nepal and allow 22 people to have their

WRITE TO FORUM

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Photographed by Flávio Rodrigues

WILDLIFE AS CANON SEES IT

A white-winged nightjar perches quietly on a bush, about to take flight on its nightly hunt for insects. Big, limpid eyes sharpen the nightjar's visibility, and an astonishingly large gape enables this acrobatic flyer to seize prey on the wing. The male defends its territory from other males and also engages in moonlit courtship displays, flying in fluttering arcs around a termite mound or a bush perch. The nightjar roosts during the day, well concealed by its variegated pattern. Vast areas of open grassland have given way to cultivation, and the endangered white-

winged nightjar now exists mainly on islands of protected areas.

As a global corporation committed to social and environmental concerns, we join in worldwide efforts to promote greater awareness of endangered species for the benefit of future generations.



White-winged Nightjar
(*Caprimulgus candicans*)

Size: Length, 19-21 cm

Weight: 46-51 g

Habitat: Open grasslands and savanna in Brazil, Paraguay and Bolivia

Surviving number: Estimated at 30-50 in Paraguay; unknown elsewhere

eyesight restored. I'm not sure who to weep for more—the Nepalese who are poor in worldly things but rich in compassion for their neighbor or the 90210 residents, wealthy in worldly things but impoverished in soul.

MORVEN R. BAKER
Ashland, Ohio

Putorana Plateau

The author indicates that this wild area was spared from the pollution emitted by mining operations at Norilsk only because of the direction of the prevailing winds and other geographic features. On the surface Norilsk might be just another example of the failure of the Soviet system to protect the environment, but I think there is a deeper lesson. Powerful central governments always create ecological disasters no matter how well-meaning the central planners might be. I am always amazed how willing environmentalists are to cede regulatory power to centralized agencies when their track record is so bad. I think the only solution for environmental protection in the long run is to adopt a free-market approach to resource conservation. Private owners protect their property better than any government agency.

JOHN S. CHOINSKI, JR.
Greenbrier, Arkansas

Luis Marden

I was deeply moved by Cathy Newman's article on Luis Marden. What an excellent tribute to a person who strived to live life to the highest potential. We could all strive to be a little more Mardenesque.

E. M. ARMAS-MIKULIK
Vancouver, British Columbia

Thirty years ago my husband and I were planning a circumnavigation in our little ketch and wanted to spend a full year in French Polynesia. We had read about Marden's discovery of *Bounty's* bones, so we wrote for information and suggestions. He responded immediately and, in his ever generous and gracious manner, invited us to his home. He arranged for a 12-month visa and wrote to his friends to expect us. Luis Marden was largely responsible for making our time in the Society Islands surpass even our wildest expectations.

ANN H. HARRIS
Terra Alta, West Virginia

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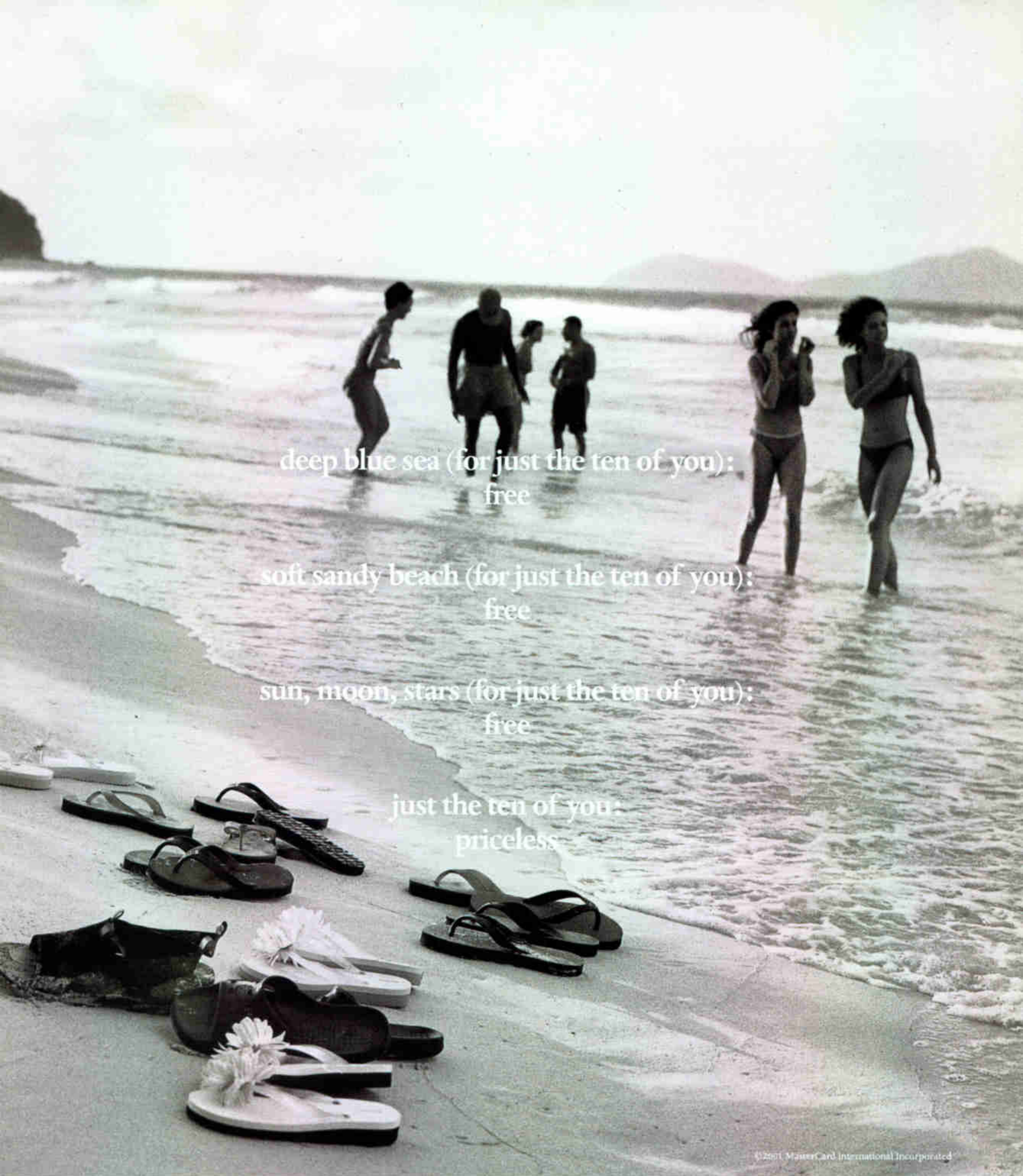
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Week #2	2/4/01	2/10/01	2/14/01
Week #3	2/11/01	2/17/01	2/21/01
Week #4	2/18/01	2/24/01	2/28/01
Week #5	2/25/01	3/3/01	3/7/01
Week #6	3/4/01	3/10/01	3/14/01
Week #7	3/11/01	3/17/01	3/21/01
Week #8	3/18/01	3/24/01	3/28/01
Week #9	3/25/01	3/31/01	4/4/01

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In the event of a dispute as to the identity of any entrant, entrant will be deemed the individual named on applicable online entry form. **Prizes: (1) Grand Prize:** 8 day/7 night trip for Grand Prize winner and up to (9) guests to a private island designated by Sponsor located off of the western tip of Tortola in the British Virgin Islands consisting of round trip coach air transportation from airport(s) designated by Sponsor near winner's/guests' residences in the U.S., double occupancy accommodations, three meals daily, and \$55,000 spending money (Approximate Retail Value "ARV" = \$165,700). Grand Prize trip must be taken between 1/19/02 and 1/26/02 or prize will be forfeited and an alternate winner will be selected. Travel restrictions apply. Minors must be accompanied by a parent/legal guardian. **(9) Weekly Prize Winners/(1) Winner Per Weekly Entry Period:** 7 day/6 night trip for (2) consisting of round trip coach air transportation from airport designated by Sponsor near winner's residence in the contiguous United States, standard double occupancy accommodations and \$500 spending money to winner's choice of one of the following destinations: 1.) Caribbean Cruise aboard Carnival Cruise Lines; 2.) Caribbean Island Getaway; 3.) Hawaiian Escape or 4.) European/UK Journey (ARV=\$5,000). Weekly Prize winners will be responsible for insurance, gratuities and for any other expenses not specifically stated herein. Blackout dates and travel/accommodation restrictions apply. Weekly Prize trips must be completed prior to 4/2002 and ticketing must occur no less than 30 days prior to date of departure or prize will be forfeited in its entirety. Trips are subject to availability at time of request and final trip itineraries, ports of departure and hotel accommodations are at Sponsor's sole discretion. **Miscellaneous:** No transfer, assignment, cash redemption, or substitution of prizes except by Sponsor due to prize unavailability, and then for a prize of equal or greater value. Taxes and any other expenses not specified herein are winners' sole responsibility. Winners will be required to execute and return an Affidavit of Eligibility, Liability Release and (where legal) Publicity Release within 5 days of issuance of notification. Winners' traveling companions (if a minor, his/her respective parent or legal guardian) will be required to sign and return a Liability Release and (where legal) Publicity Release prior to the issuance of travel documents. Where applicable, winners and their respective traveling companion(s) must have valid Passports at time of departure. Grand Prize winner and guests agree to comply with all MasterCard rules and regulations relating to their stay on the designated private island. If any prize notification letter is returned as undeliverable, winner will be disqualified and an alternate winner will be selected. Non-compliance with any of the foregoing may result in disqualification and awarding of prize to an alternate winner. By participating, entrants agree to be bound by these Official Rules and agree that Sponsor and its subsidiaries, affiliates, distributors and advertising/promotion agencies: 1.) shall have the right and permission to use (unless prohibited by law) their name, voice, city/state of residence, photograph and/or likeness for advertising and/or trade and/or any other purpose in any media or format now or hereafter known without further compensation, permission or notification and 2.) that the aforesaid parties, Project Support Team, Inc. and all of their respective officers, directors, employees, representatives and agents shall have no liability and will be held harmless by entrant for any liability, loss, injury or damage to themselves or any other person or entity, including, without limitation, personal injury, death or damage to personal or real property, due in whole or in part, directly or indirectly, by reason of the acceptance, possession, use or misuse of a prize or participation in this sweepstakes and any travel related thereto. Sponsor reserves the right, in its sole discretion, to modify, terminate or suspend this sweepstakes should virus, bugs, non-authorized human intervention or other causes beyond the reasonable control of Sponsor corrupt or impair the administration, security, fairness or proper play of the sweepstakes and, in any such event, select winners from those eligible, non-suspect entries received prior to event requiring such modification, termination or suspension. **Winners List:** For the winners' names, send a self-addressed, stamped envelope to be received by 5/31/01 to: MasterCard® Getaways Sweepstakes™ Winners, P.O. Box 5988, Unionville, CT 06087-5988.

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Geographica

Poor old Buddha. Spurning his vast family inheritance, he lived a life of asceticism and worldly deprivation—teaching his followers to eschew all the prideful things of Earth. Now, while millions of their countrymen are starving to death, the Indian Buddhists are building a hundred-million-dollar gold statue in his honor! They have no idea what he died attempting to teach them.

GENE NEILL
Mayo, Florida

I welcome the Maitreya Project with some reservations. Gautama Buddha is to be depicted as being Oriental. Vast numbers of Buddhists through time were not Oriental. Many are not Oriental today. Depicting the Buddha in a fixed racial mold sends a message of exclusion, a message that I am certain Buddhism would never want to be associated with.

HARBIR SINGH
Ann Arbor, Michigan

The article "Angel Island," which describes the suffering of Chinese immigrants in California between 1910 and 1940, completely neglects the fact that other Asian immigrants, namely those of Indian origin, underwent the very same racially biased treatment. These immigrants were not allowed to apply for permanent U.S. residency or to marry members of the white race. They struggled hard, married Mexican Americans, and finally settled down as farmers and succeeded by sheer perseverance and industry.

BYRAVAN VISWANATHAN
Gettysburg, Pennsylvania

Ask Us

Your November Ask Us challenge was a no-brainer to me and many other GIs who served in Southeast Asia during the 1960s and '70s. Many of us, especially those serving with the 1st and 25th Infantry Divisions, crawled through and cleared many kilometers of those tunnels. Unfortunately, many of the Tunnel Rats have their names engraved for posterity on the Vietnam War Memorial. Others are in hospitals. The lucky ones were able to put it behind us, but the memories will always be there.

ANTHONY BAUNE
Las Vegas, Nevada

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Entries for 1st drawing must be received between 12:00 a.m. ET, Jan. 1, 2001 and 11:59 p.m. ET, Jan. 31, 2001. Entries for remaining drawings must be received between 12:00 a.m. ET on the 1st day of each month and 11:59 p.m. ET of the last day of each month, from Feb. through June. To enter and/or obtain complete rules,

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CHRISTIANA FIGUERES
Conservationist

She found inspiration in the forests of Latin America. Saw her calling in her children's eyes. And has dedicated herself to a global energy revolution. Her name is Christiana Figueres. She's made key contributions bridging the gap between countries on climate issues. Champions new technologies that conserve energy. Promotes the economic sense of environmental responsibility. And is founder and Executive Director of the Center for Sustainable Development in the Americas. 🌱 Christiana Figueres, climate change specialist, is one of Ford Motor Company's Heroes for the Planet. A program that's part of ongoing Ford Motor Company initiatives to underwrite and support efforts that make the world a better place. 🌱 To learn more about Ms. Figueres and other Heroes for the Planet, visit our website. You'll find fascinating information, including links to her favorite websites. Around the globe, there are amazing individuals who've dedicated their lives to our planet. You'll find them at www.ford.com/heroes. Stop by. The world is waiting.

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EarthPulse

ENERGY

Insatiable Appetites

Rising global energy consumption fuels the search for alternatives

An engine revs, a smokestack spews, a bulb glows—energy in all its forms powers the world, often in ways hazardous to global health. Most of the world’s energy comes from oil, coal, and natural gas—fossil fuels that emit some 22 billion tons of carbon dioxide into Earth’s atmosphere each year. Such emissions could rise 55 percent by 2020 as populations swell, according to the U.S. Department of Energy. A jump in carbon

dioxide and other greenhouse gases could boost smog, ozone depletion, and global warming. But past needn’t be prologue. Spurred by environmental concerns and economics, some industrial and developing nations are improving energy efficiency and turning to renewable sources, and not only because of finite supplies of fossil fuels. Says Don Huberts of Shell Hydrogen: “The Stone Age didn’t end because the world ran out of stones.”

Coal: The Dirtiest Fuel

Share of world consumption, 1999

Gouged from the ground, coal has more carbon than any other fuel. When burned, it releases carbon, mercury, lead, and sulfur into the air. China and India are projected to account for the greatest rise in the use of coal.

United States 25.5%
China 24.0%

India 7.0%

Germany 140

Japan 113

Russia 55

China 10

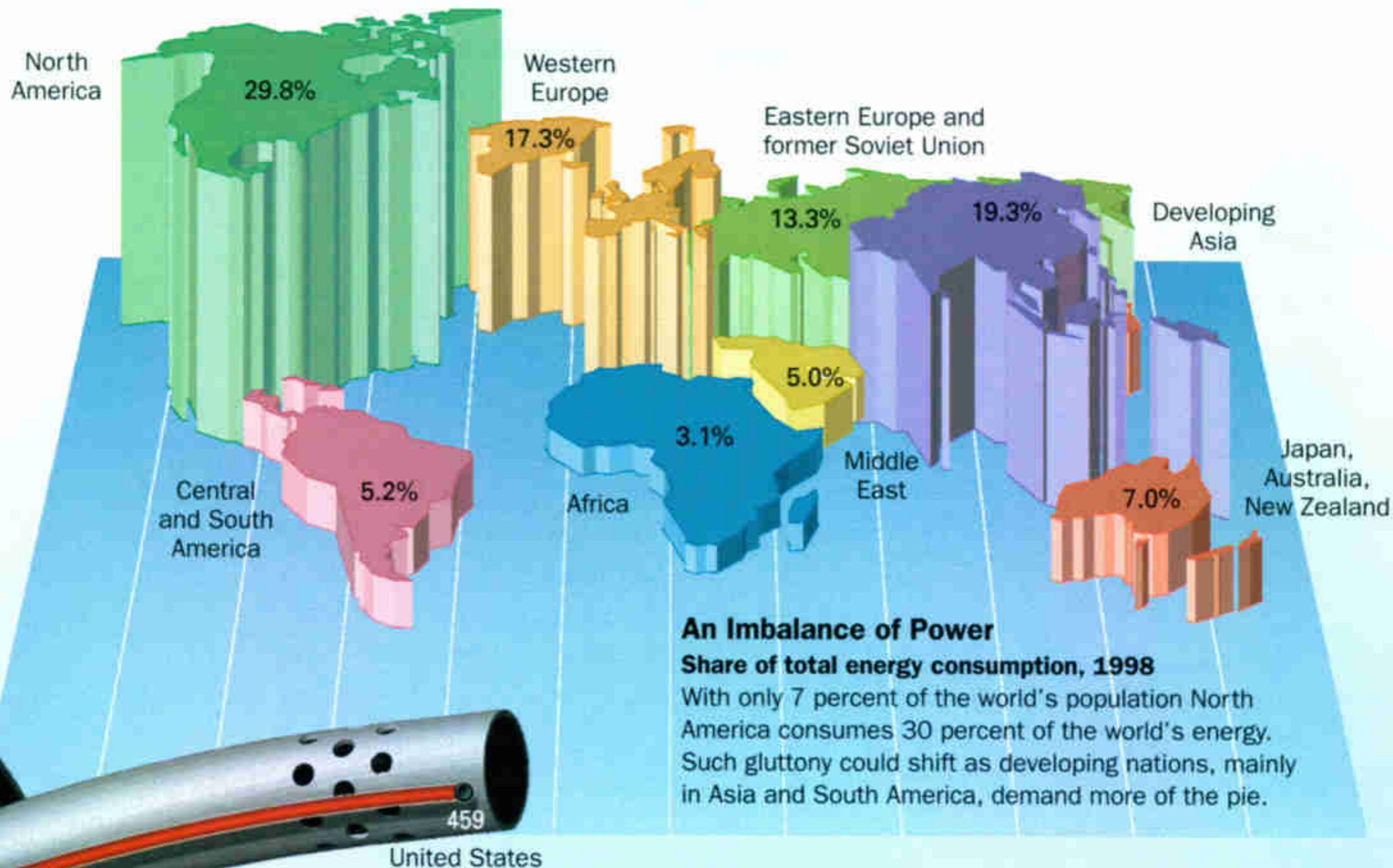
Canada 303

Gasoline: A Growing Habit

Gallons of gasoline per capita, 1997

By far the world’s biggest gas guzzler, the U.S. leads in both yearly per capita use (right) and total consumption. (Canada’s per capita use is high, but it ranks fifth in total gallons used.) As developing nations prosper, more cars—and their emissions—will degrade the air.





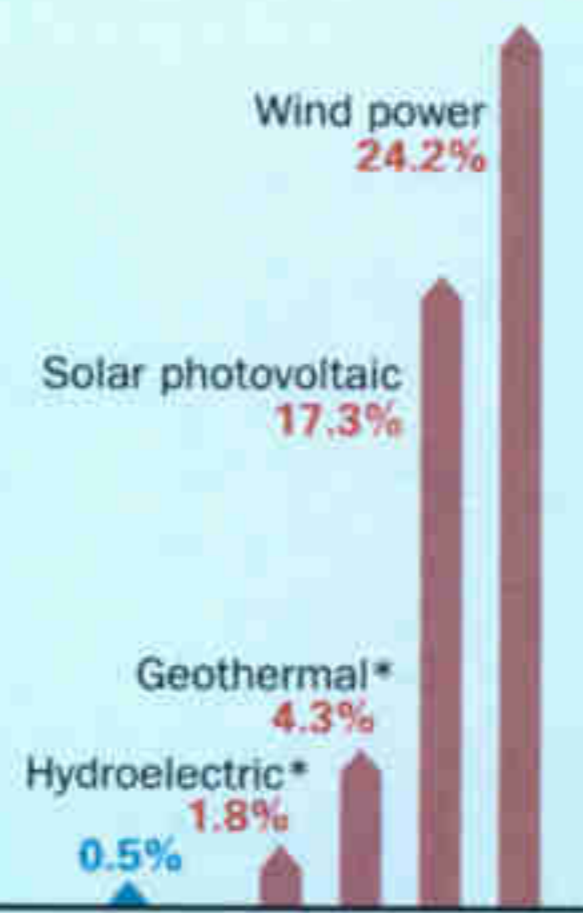
An Imbalance of Power

Share of total energy consumption, 1998

With only 7 percent of the world's population North America consumes 30 percent of the world's energy. Such gluttony could shift as developing nations, mainly in Asia and South America, demand more of the pie.

Alternatives: Seeing the Light

Though fossil fuels reign supreme, some 14 percent of the world's energy still comes from biomass—firewood, crop waste, even animal dung. Yet other "renewables" like solar, wind, and geothermal are the fastest growing sources of energy. Some analysts predict that by 2050 half the world's energy could be renewable.



Energy Sector Growth Rates (1990-1999)

Shares of World Energy Sources (1999)



* 1990-1998 data
** includes 14% biomass



Natural Gas: Gaining Ground

Share of world consumption, 1999

Once flared off as oil-field waste, natural gas is increasingly coveted as a primary energy source. A cleaner, more efficient fossil fuel than coal or oil, its use is projected to jump more than 40 percent by 2010.

Get Involved

How can you make a difference? Find a listing of resources and a forum at nationalgeographic.com/ngm/0103/earthpulse.

For information about energy-efficient consumer products: www.epa.gov/energystar

To learn about renewable energy, check out the Green Power Network: www.eren.doe.gov/greenpower.



The idea took shape during the energy crisis of '73. The result is an innovative, pollution-free, battery-powered city car. As part of an ongoing commitment to affordable alternative transportation for our consumers, we'll introduce the TH!NK city to the United States and Canada in 2002. The name itself asks you to consider what getting from here to there is all about every time you see one on the street.

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G E O G R

T H E P E O P L E , P L A C E S , A N D

GEOGRAPHY

After the Deluge

Australian rains fill long-dry Lake Eyre—for a while

South Australia's Lake Eyre isn't usually a lake at all. Most of the time it's the world's largest salt flat, taking up some 3,700 square miles. Before 1950 it was considered permanently dry; the last time it held any significant amount of water was 1989. But in 2000 heavy rains associated with La Niña filled the lake again, bringing a new, green ecosystem to the desert. Such verdant times don't last—the water usually disappears in about a year. Evaporation is its only form of escape; the lake bed is Australia's lowest point, 52 feet below sea level, so there's nowhere for Lake Eyre's water to go but up.

CONSERVATION

Refugee From the Burning West

Unlike Smokey, this bear cub will return to the wild



TOM BAUER, ASSOCIATED PRESS

Fifty years ago a young black bear rescued from a New Mexico forest fire was named Smokey and became a national fire-prevention symbol. Last August this black bear cub with burned paws was saved by a Montana game warden from a fire that raged through Bitterroot National Forest.

"He has not been named, and he's going home," says Spence Hegstad of the Montana Fish, Wildlife, and Parks Foundation. "We plan to put him in a hand-dug den with a second orphaned bear and let them hibernate."

Drought fueled one of the worst wildfire seasons in U.S. history last year. Nationwide 30,000 firefighters battled some 90,000 fires that burned more than seven million acres.

APHICA

CREATURES OF OUR UNIVERSE



JASON EDWARDS, BIO-IMAGES (ABOVE); GORDON WILTSIE (BELOW LEFT); ART BY PETER GAEDE

EVOLUTION

Plant That Beat the Ice Age

In glacier-free Arctic zones purple saxifrage lived on

Ice held most of the northern latitudes in its grip 18,000 years ago—with important exceptions. In the last ice age glaciers never completely covered eastern Siberia, Alaska, and the Yukon. Could ice-free areas there

have served as refuges for Arctic plants during the glaciation?

Biologist Richard Abbott of Scotland's University of St. Andrews and colleagues say yes. They tested the DNA of purple saxifrage living in the Arctic

today. Alaska plants showed the highest genetic diversity, suggesting an uninterrupted history stretching back to Ice Age times. Baffin Island

ALMANAC

March

Nearly all creatures flee the onset of the dark and brutal Antarctic winter—but not 400,000 emperor penguins. They gather in colonies to breed on sea ice as it forms. Females choose mates, then leave their eggs with the males to incubate for two months while the females feed at sea.



in the Canadian Arctic was almost completely glaciated, and purple saxifrage there (left) showed no genetic diversity, indicating that it recolonized later.



ARCHAEOLOGY

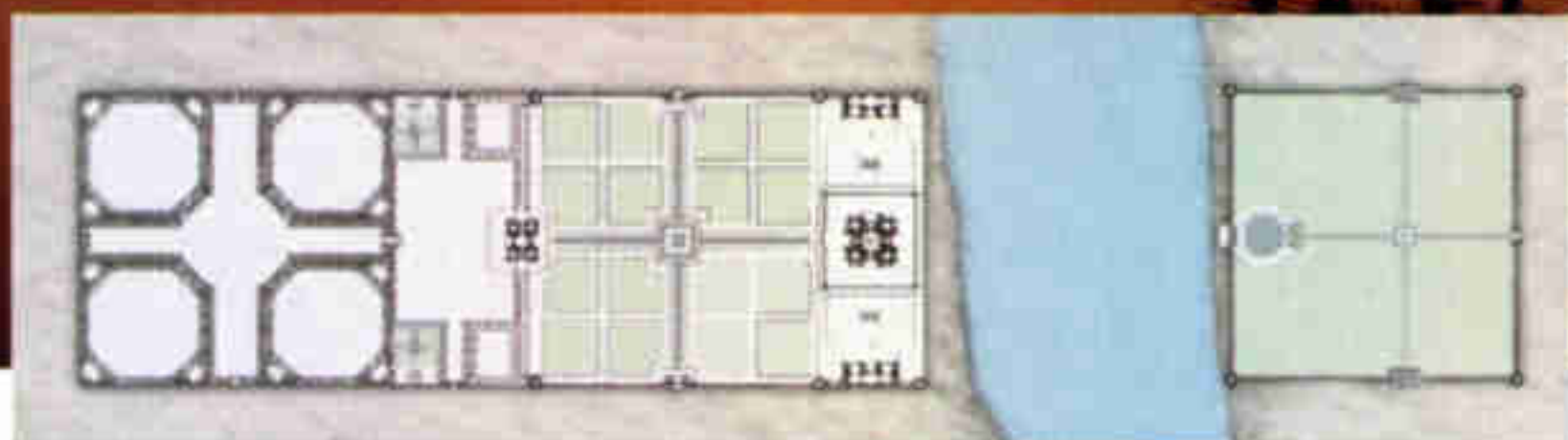
Brought to Light

New dawn for a night garden at the Taj Mahal

Mogul emperor Shah Jahan memorialized his beloved wife in 1648 with the white-domed Taj Mahal in Agra, India. But there was more to his tribute: the Mahtab Bagh, a 24-acre garden across the Yamuna River (above), designed

to be enjoyed at night. Abandoned due to flooding and buried under silt, the garden was recently documented in a joint project by the Archaeological Survey of India and the Sackler Gallery of the Smithsonian

Institution in Washington, D.C., and is the subject of a new book, *The Moonlight Garden: New Discoveries at the Taj Mahal*. The survey revealed that the site was an integral part of the famous tomb complex (inset).



PHOTOGRAPH BY NEIL GREENTREE, ARTHUR M. SACKLER GALLERY; INSET, SACKLER GALLERY



AUGUSTIN OCHSENREITER, SOUTH TYROL MUSEUM OF ARCHAEOLOGY, BOLZANO, ITALY

ANTHROPOLOGY

The Iceman Warms Up

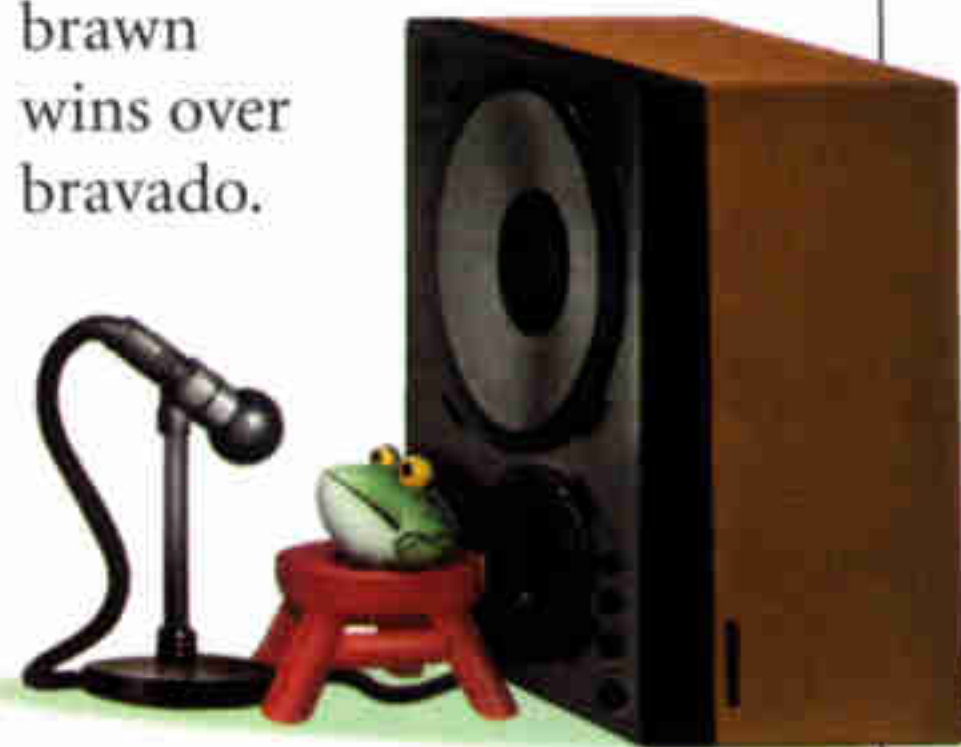
Medical tests performed on defrosted mummy

First he froze. Some 5,000 years later, in 1991, hikers found him, mummified, protruding from a glacier (GEOGRAPHIC, June 1993). For years Austria and Italy battled over custody of his body, found along the border between the two countries. Many tests were done to probe his secrets, but he was kept frozen to prevent deterioration. Then last September Italian scientists briefly thawed the mummy (above) to take tooth and bone samples that will let them analyze his DNA—a window on the genetics of prehistoric man.

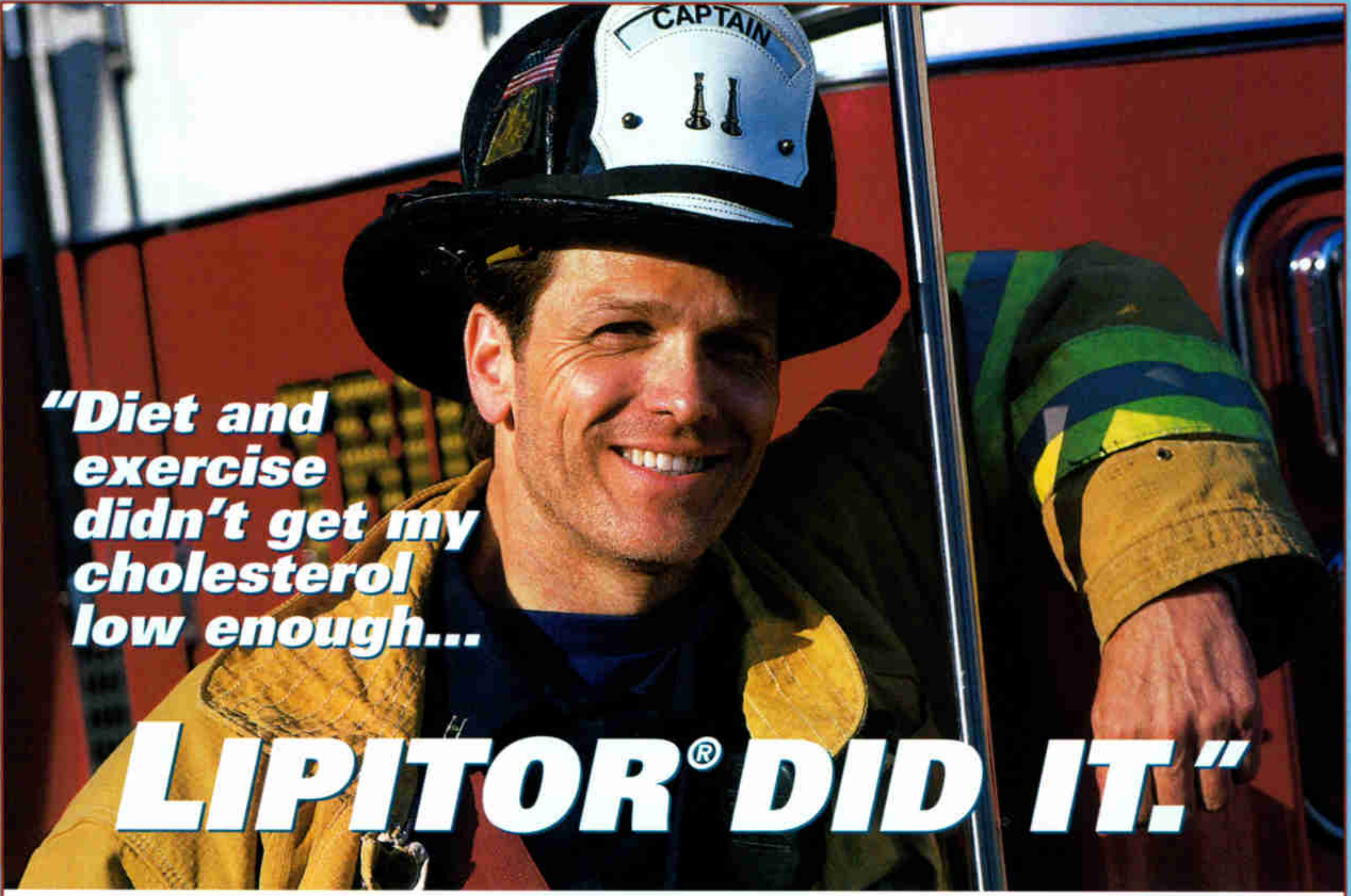
BIOLOGY

Deep Croak

Some male green frogs that go a-courting try cheating. Competitors splash toward each other, croaking as they go. Big males broadcast low, intimidating calls, while small males normally emit high ones. Now biologist Mark Bee at the University of Missouri and colleagues have found that little males lower their voices to sound like the big guys. But when suitors make eye contact, brawn wins over bravado.



ART BY BILL MAYER



"Diet and exercise didn't get my cholesterol low enough..."

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LIPITOR has been proven effective in clinical studies: LIPITOR, with diet and exercise, lowered LDL (bad) cholesterol 39–60%, total cholesterol 29–45%, and triglycerides 19–37%.

reported side effects include constipation, flatulence, dyspepsia, and abdominal pain.

Only your doctor or healthcare provider can determine if LIPITOR is right for you. Some people should not take LIPITOR, including those with liver disease or possible liver problems, women who are nursing, pregnant, or may become pregnant, or people who are allergic to any of the ingredients in LIPITOR.

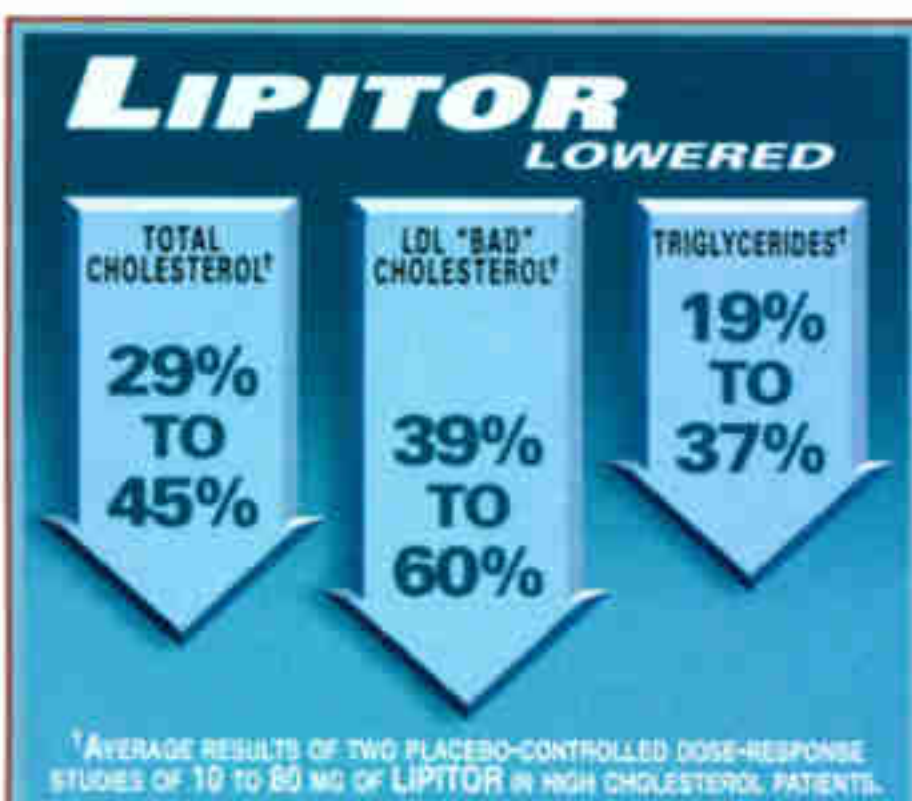
It's important to tell your doctor about any medications you are currently taking to avoid possible serious drug interactions. Your doctor may perform simple blood tests to monitor liver function before and during treatment.

If you are taking LIPITOR, tell your doctor about any unusual muscle pain or weakness, as this could be a sign of serious side effects.

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Please see important additional information on next page.



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LIPITOR has not been shown to prevent heart disease or heart attack.

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LIPITOR® (Atorvastatin Calcium) Tablets
Brief Summary of Prescribing Information

CONTRAINDICATIONS: Active liver disease or unexplained persistent elevations of serum transaminases. Hypersensitivity to any component of this medication. **Pregnancy and Lactation** — Atherosclerosis is a chronic process and discontinuation of lipid-lowering drugs during pregnancy should have little impact on the outcome of long-term therapy of primary hypercholesterolemia. Cholesterol and other products of cholesterol biosynthesis are essential components for fetal development (including synthesis of steroids and cell membranes). Since HMG-CoA reductase inhibitors decrease cholesterol synthesis and possibly the synthesis of other biologically active substances derived from cholesterol, they may cause fetal harm when administered to pregnant women. Therefore, HMG-CoA reductase inhibitors are contraindicated during pregnancy and in nursing mothers. **ATORVASTATIN SHOULD BE ADMINISTERED TO WOMEN OF CHILDBEARING AGE ONLY WHEN SUCH PATIENTS ARE HIGHLY UNLIKELY TO CONCEIVE AND HAVE BEEN INFORMED OF THE POTENTIAL HAZARDS.** If the patient becomes pregnant while taking this drug, therapy should be discontinued and the patient apprised of the potential hazard to the fetus.

WARNINGS: Liver Dysfunction — HMG-CoA reductase inhibitors, like some other lipid-lowering therapies, have been associated with biochemical abnormalities of liver function. **Persistent elevations >3 times the upper limit of normal (ULN) occurring on 2 or more occasions in serum transaminases occurred in 0.7% of patients who received atorvastatin in clinical trials. The incidence of these abnormalities was 0.2%, 0.2%, 0.6%, and 2.3% for 10, 20, 40, and 80 mg, respectively.** One patient in clinical trials developed jaundice. Increases in liver function tests (LFT) in other patients were not associated with jaundice or other clinical signs or symptoms. Upon dose reduction, drug interruption, or discontinuation, transaminase levels returned to or near pretreatment levels without sequelae. Eighteen of 30 patients with persistent LFT elevations continued treatment with a reduced dose of atorvastatin. **It is recommended that liver function tests be performed prior to and at 12 weeks following both the initiation of therapy and any elevation of dose, and periodically (eg, semiannually) thereafter.** Liver enzyme changes generally occur in the first 3 months of treatment with atorvastatin. Patients who develop increased transaminase levels should be monitored until the abnormalities resolve. Should an increase in ALT or AST of >3 times ULN persist, reduction of dose or withdrawal of atorvastatin is recommended. Atorvastatin should be used with caution in patients who consume substantial quantities of alcohol and/or have a history of liver disease. Active liver disease or unexplained persistent transaminase elevations are contraindications to the use of atorvastatin (see CONTRAINDICATIONS). **Skeletal Muscle** —

Rhabdomyolysis with acute renal failure secondary to myoglobinuria has been reported with other drugs in this class. Uncomplicated myalgia has been reported in atorvastatin-treated patients (see ADVERSE REACTIONS). Myopathy, defined as muscle aches or muscle weakness in conjunction with increases in creatine phosphokinase (CPK) values >10 times ULN, should be considered in any patient with diffuse myalgias, muscle tenderness or weakness, and/or marked elevation of CPK. Patients should be advised to report promptly unexplained muscle pain, tenderness or weakness, particularly if accompanied by malaise or fever. Atorvastatin therapy should be discontinued if markedly elevated CPK levels occur or myopathy is diagnosed or suspected. The risk of myopathy during treatment with other drugs in this class is increased with concurrent administration of cyclosporine, fibric acid derivatives, erythromycin, niacin, or azole antifungals. Physicians considering combined therapy with atorvastatin and fibric acid derivatives, erythromycin, immunosuppressive drugs, azole antifungals, or lipid-lowering doses of niacin should carefully weigh the potential benefits and risks and should carefully monitor patients for any signs or symptoms of muscle pain, tenderness, or weakness, particularly during the initial months of therapy and during any periods of upward dosage titration of either drug. Periodic creatine phosphokinase (CPK) determinations may be considered in such situations, but there is no assurance that such monitoring will prevent the occurrence of severe myopathy. **Atorvastatin therapy should be temporarily withheld or discontinued in any patient with an acute, serious condition suggestive of a myopathy or having a risk factor predisposing to the development of renal failure secondary to rhabdomyolysis (eg, severe acute infection, hypotension, major surgery, trauma, severe metabolic, endocrine and electrolyte disorders, and uncontrolled seizures).**

PRECAUTIONS: General — Before instituting therapy with atorvastatin, an attempt should be made to control hypercholesterolemia with appropriate diet, exercise, and weight reduction in obese patients, and to treat other underlying medical problems (see INDICATIONS AND USAGE in full prescribing information). **Information for Patients** — Patients should be advised to report promptly unexplained muscle pain, tenderness, or weakness, particularly if accompanied by malaise or fever. **Drug Interactions** — The risk of myopathy during treatment with other drugs of this class is increased with concurrent administration of cyclosporine, fibric acid derivatives, niacin (nicotinic acid), erythromycin, azole antifungals (see WARNINGS, Skeletal Muscle). **Antacid:** When atorvastatin and Maalox® TC suspension were coadministered, plasma concentrations of atorvastatin decreased approximately 35%. However, LDL-C reduction was not altered. **Antipyrene:** Because atorvastatin does not affect the pharmacokinetics of antipyrene, interactions with other drugs metabolized via the same cytochrome isozymes are not expected. **Colestipol:** Plasma concentrations of atorvastatin decreased approximately 25% when colestipol and atorvastatin were coadministered. However, LDL-C reduction was greater when atorvastatin and colestipol were coadministered than when either drug was given alone. **Cimetidine:** Atorvastatin plasma concentrations and LDL-C reduction were not altered by coadministration of cimetidine. **Digoxin:** When multiple doses of atorvastatin and digoxin were coadministered, steady-state plasma digoxin concentrations increased by approximately 20%. Patients taking digoxin should be monitored appropriately. **Erythromycin:** In healthy individuals, plasma concentrations of atorvastatin increased approximately 40% with coadministration of atorvastatin and erythromycin, a known inhibitor of cytochrome P450 3A4 (see WARNINGS, Skeletal Muscle). **Oral Contraceptives:** Coadministration of atorvastatin and an oral contraceptive increased AUC values for norethindrone and ethinyl estradiol by approximately 30% and 20%. These increases should be considered when selecting an oral contraceptive for a woman taking atorvastatin.

Warfarin: Atorvastatin had no clinically significant effect on prothrombin time when administered to patients receiving chronic warfarin treatment. **Endocrine Function** — HMG-CoA reductase inhibitors interfere with cholesterol synthesis and theoretically might blunt adrenal and/or gonadal steroid production. Clinical studies have shown that atorvastatin does not reduce basal plasma cortisol concentration or impair adrenal reserve. The effects of HMG-CoA reductase inhibitors on male fertility have not been studied in adequate numbers of patients. The effects, if any, on the pituitary-gonadal axis in premenopausal women are unknown. Caution should be exercised if an HMG-CoA reductase inhibitor is administered concomitantly with drugs that may decrease the levels or activity of endogenous steroid hormones, such as ketoconazole, spironolactone, and cimetidine. **CNS Toxicity** — Brain hemorrhage was seen in a female dog treated for 3 months at 120 mg/kg/day. Brain hemorrhage and optic nerve vacuolation were seen in another female dog that was sacrificed in moribund condition after 11 weeks of escalating doses up to 280 mg/kg/day. The 120 mg/kg dose resulted in a systemic exposure approximately 16 times the human plasma area-under-the-curve (AUC, 0-24 hours) based on the maximum human dose of 80 mg/day. A single tonic convulsion was seen in each of 2 male dogs (one treated at 10 mg/kg/day and one at 120 mg/kg/day) in a 2-year study. No CNS lesions have been observed in mice after chronic treatment for up to 2 years at doses up to 400 mg/kg/day or in rats at doses up to 100 mg/kg/day. These doses were 6 to 11 times (mouse) and 8 to 16 times (rat) the human AUC (0-24) based on the maximum recommended human dose of 80 mg/day. CNS vascular lesions, characterized by perivascular hemorrhages, edema, and mononuclear cell infiltration of perivascular spaces, have been observed in dogs treated with other members of this class. A chemically similar drug in this class produced optic nerve degeneration (Wallerian degeneration of retinogeniculate fibers) in clinically normal dogs in a dose-dependent fashion at a dose that produced plasma drug levels about 30 times higher than the mean drug level in humans taking the highest recommended dose. **Carcinogenesis, Mutagenesis, Impairment of Fertility** — In a 2-year carcinogenicity study in rats at dose levels of 10, 30, and 100 mg/kg/day, 2 rare tumors were found in muscle in high-dose females: in one, there was a rhabdomyosarcoma and, in another, there was a fibrosarcoma. This dose represents a plasma AUC (0-24) value of approximately 16 times the mean human plasma drug exposure after an 80 mg oral dose. A 2-year carcinogenicity study in mice given 100, 200, or 400 mg/kg/day resulted in a significant increase in liver adenomas in high-dose males and liver carcinomas in high-dose females. These findings occurred at plasma AUC (0-24) values of approximately 6 times the mean human plasma drug exposure after an 80 mg oral dose. *In vitro*, atorvastatin was not mutagenic or clastogenic in the following tests with and without metabolic activation: the Ames test with *Salmonella typhimurium* and *Escherichia coli*, the HGPRT forward mutation assay in Chinese hamster lung cells, and the chromosomal aberration assay in Chinese hamster lung cells. Atorvastatin was negative in the *in vivo* mouse micronucleus test. Studies in rats performed at doses up to 175 mg/kg (15 times the human exposure) produced no changes in fertility.

There was aplasia and aspermia in the epididymis of 2 of 10 rats treated with 100 mg/kg/day of atorvastatin for 3 months (16 times the human AUC at the 80 mg dose); testis weights were significantly lower at 30 and 100 mg/kg and epididymal weight was lower at 100 mg/kg. Male rats given 100 mg/kg/day for 11 weeks prior to mating had decreased sperm motility, sperm head concentration, and increased abnormal sperm. Atorvastatin caused no adverse effects on semen parameters, or reproductive organ histopathology in dogs given doses of 10, 40, or 120 mg/kg for two years. **Pregnancy** — **Pregnancy Category X: See CONTRAINDICATIONS.** Safety in pregnant women has not been established. Atorvastatin crosses the rat placenta and reaches a level in fetal liver equivalent to that of maternal plasma. Atorvastatin was not teratogenic in rats at doses up to 300 mg/kg/day or in rabbits at doses up to 100 mg/kg/day. These doses resulted in multiples of about 30 times (rat) or 20 times (rabbit) the human exposure based on surface area (mg/m²). In a study in rats given 20, 100, or 225 mg/kg/day, from gestation day 7 through to lactation day 21 (weaning), there was decreased pup survival at birth, neonate, weaning, and maturity in pups of mothers dosed with 225 mg/kg/day. Body weight was decreased on days 4 and 21 in pups of mothers dosed at 100 mg/kg/day; pup body weight was decreased at birth and at days 4, 21, and 91 at 225 mg/kg/day. Pup development was delayed (rotorod performance at 100 mg/kg/day and acoustic startle at 225 mg/kg/day; pinnae detachment and eye opening at 225 mg/kg/day). These doses correspond to 6 times (100 mg/kg) and 22 times (225 mg/kg) the human AUC at 80 mg/day. Rare reports of congenital anomalies have been received following intrauterine exposure to HMG-CoA reductase inhibitors. There has been one report of severe congenital bony deformity, tracheo-esophageal fistula, and anal atresia (VATER association) in a baby born to a woman who took lovastatin with dextroamphetamine sulfate during the first trimester of pregnancy. LIPITOR should be administered to women of child-bearing potential only when such patients are highly unlikely to conceive and have been informed of the potential hazards. If the woman becomes pregnant while taking LIPITOR, it should be discontinued and the patient advised again as to the potential hazards to the fetus. **Nursing Mothers** — Nursing rat pups had plasma and liver drug levels of 50% and 40%, respectively, of that in their mother's milk. Because of the potential for adverse reactions in nursing infants, women taking LIPITOR should not breast-feed (see CONTRAINDICATIONS). **Pediatric Use** — Treatment experience in a pediatric population is limited to doses of LIPITOR up to 80 mg/day for 1 year in 8 patients with homozygous FH. No clinical or biochemical abnormalities were reported in these patients. None of these patients was below 9 years of age. **Geriatric Use** — Treatment experience in adults age ≥70 years with doses of LIPITOR up to 80 mg/day has been evaluated in 221 patients. The safety and efficacy of LIPITOR in this population were similar to those of patients <70 years of age.

ADVERSE REACTIONS: LIPITOR is generally well-tolerated. Adverse reactions have usually been mild and transient. In controlled clinical studies of 2502 patients, <2% of patients were discontinued due to adverse experiences attributable to atorvastatin. The most frequent adverse events thought to be related to atorvastatin were constipation, flatulence, dyspepsia, and abdominal pain. **Clinical Adverse Experiences** — Adverse experiences reported in ≥2% of patients in placebo-controlled clinical studies of atorvastatin, regardless of causality assessment, are shown in the following table.

Adverse Events in Placebo-Controlled Studies (% of Patients)					
Adverse Event	Placebo	Atorvastatin	Atorvastatin	Atorvastatin	Atorvastatin
	N = 270	10 mg N = 863	20 mg N = 36	40 mg N = 79	80 mg N = 94
BODY AS A WHOLE					
Infection	10.0	10.3	2.8	10.1	7.4
Headache	7.0	5.4	16.7	2.5	6.4
Accidental Injury	3.7	4.2	0.0	1.3	3.2
Flu Syndrome	1.9	2.2	0.0	2.5	3.2
Abdominal Pain	0.7	2.8	0.0	3.8	2.1
Back Pain	3.0	2.8	0.0	3.8	1.1
Allergic Reaction	2.6	0.9	2.8	1.3	0.0
Asthenia	1.9	2.2	0.0	3.8	0.0
DIGESTIVE SYSTEM					
Constipation	1.8	2.1	0.0	2.5	1.1
Diarrhea	1.5	2.7	0.0	3.8	5.3
Dyspepsia	4.1	2.3	2.8	1.3	2.1
Flatulence	3.3	2.1	2.8	1.3	1.1
RESPIRATORY SYSTEM					
Sinusitis	2.6	2.8	0.0	2.5	6.4
Pharyngitis	1.5	2.5	0.0	1.3	2.1
SKIN AND APPENDAGES					
Rash	0.7	3.9	2.8	3.8	1.1
MUSCULOSKELETAL SYSTEM					
Arthralgia	1.5	2.0	0.0	5.1	0.0
Myalgia	1.1	3.2	5.6	1.3	0.0

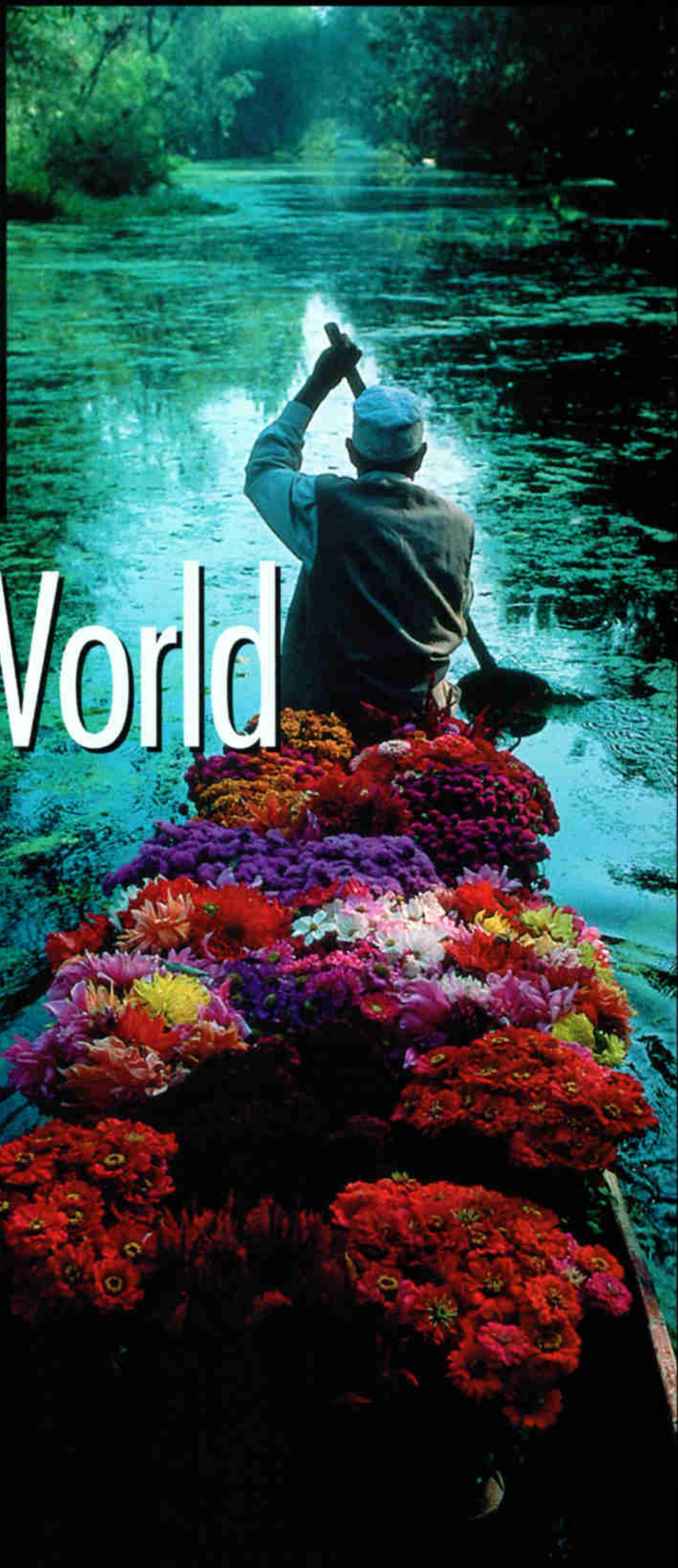
The following adverse events were reported, regardless of causality assessment in patients treated with atorvastatin in clinical trials. The events in *italics* occurred in ≥2% of patients and the events in plain type occurred in <2% of patients.

Body as a Whole: Chest pain, face edema, fever, neck rigidity, malaise, photosensitivity reaction, generalized edema. **Digestive System:** Nausea, gastroenteritis, liver function tests abnormal, colitis, vomiting, gastritis, dry mouth, rectal hemorrhage, esophagitis, eructation, glossitis, mouth ulceration, anorexia, increased appetite, stomatitis, biliary pain, cheilitis, duodenal ulcer, dysphagia, enteritis, melena, gum hemorrhage, stomach ulcer, tenesmus, ulcerative stomatitis, hepatitis, pancreatitis, cholestatic jaundice. **Respiratory System:** Bronchitis, rhinitis, pneumonia, dyspnea, asthma, epistaxis. **Nervous System:** Insomnia, dizziness, paresthesia, somnolence, amnesia, abnormal dreams, libido decreased, emotional lability, incoordination, peripheral neuropathy, torticollis, facial paralysis, hyperkinesia, depression, hyposthesia, hypertension. **Musculoskeletal System:** Arthritis, leg cramps, bursitis, tenosynovitis, myasthenia, tendinous contracture, myositis. **Skin and Appendages:** Pruritus, contact dermatitis, alopecia, dry skin, sweating, acne, urticaria, eczema, seborrhea, skin ulcer. **Urogenital System:** Urinary tract infection, urinary frequency, cystitis, hematuria, impotence, dysuria, kidney calculus, nocturia, epididymitis, fibrocystic breast, vaginal hemorrhage, albuminuria, breast enlargement, metrorrhagia, nephritis, urinary incontinence, urinary retention, urinary urgency, abnormal ejaculation, uterine hemorrhage. **Special Senses:** Amblyopia, tinnitus, dry eyes, refraction disorder, eye hemorrhage, deafness, glaucoma, parosmia, taste loss, taste perversion. **Cardiovascular System:** Palpitation, vasodilatation, syncope, migraine, postural hypotension, phlebitis, arrhythmia, angina pectoris, hypertension. **Metabolic and Nutritional Disorders:** Peripheral edema, hyperglycemia, creatine phosphokinase increased, gout, weight gain, hypoglycemia. **Hemic and Lymphatic System:** Echinosis, anemia, lymphadenopathy, thrombocytopenia, petechia. **Postintroduction Reports** — Adverse events associated with LIPITOR therapy reported since market introduction, that are not listed above, regardless of causality assessment, include the following: anaphylaxis, angioneurotic edema, bullous rashes (including erythema multiforme, Stevens-Johnson syndrome, and toxic epidermal necrolysis), and rhabdomyolysis.

OVERDOSAGE: There is no specific treatment for atorvastatin overdose. In the event of an overdose, the patient should be treated symptomatically, and supportive measures instituted as required. Due to extensive drug binding to plasma proteins, hemodialysis is not expected to significantly enhance atorvastatin clearance.

Consult package insert before prescribing LIPITOR® (Atorvastatin Calcium) Tablets.
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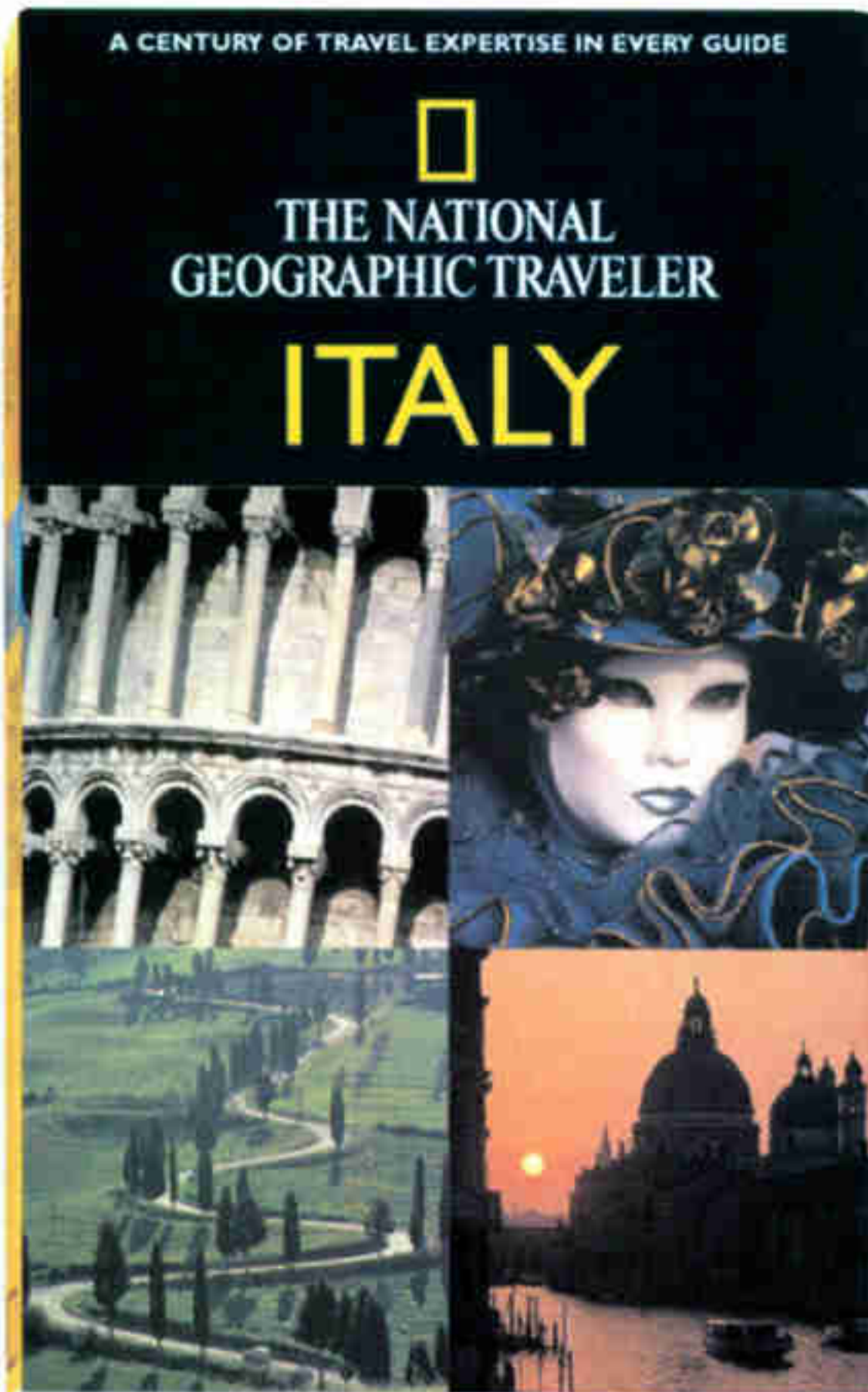
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Behind the SCENES

AT THE NATIONAL GEOGRAPHIC SOCIETY



Combining Forces

NPR, GEOGRAPHIC join to sound the news

RANDY OLSON

Plunging into his work and into the waters off Palmyra Atoll, Alex Chadwick (above) does double duty: gathering information for a GEOGRAPHIC article (page 46) and for his *Radio Expeditions* series on National Public Radio.

NPR and the Society launched *Radio Expeditions*, the brain-child of NPR executive producer

Carolyn Jensen, a decade ago. "She's always believed in the GEOGRAPHIC idea of stories about the natural world and different cultures," Alex says. "She wanted to marry that to NPR's excellence, take NATIONAL GEOGRAPHIC's editorial bent and add NPR's sound capabilities." Alex has been with the series since its beginning, writing and narrating

a monthly story—often in two or more parts—for the weekday *Morning Edition* news program.

The Palmyra Atoll venture marks the first time the magazine and the radio series have joined forces. "When I told the magazine I was going for *Radio Expeditions*, an editor called right back and said, 'Why don't you write it for us?'" Alex says.



RICK RIDGEWAY

An Emotional Climb to a Death Site

In 1980, en route to a GEOGRAPHIC assignment, Jonathan Wright and Rick Ridgeway—climbers, photographers, and friends—climbed Minya Konka, a Sichuan peak. An avalanche struck as they ascended; Jonathan died in Rick's arms, leaving a wife and 16-month-old daughter, Asia. Rick recently led Asia, now a Colorado college student, on a journey to Nepal and China and to Minya Konka, where they reached and rebuilt her father's grave (left). "It felt like something we could do for her, for him, for me," Rick says.



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STEPHANIE MAZE (ABOVE LEFT); CRAIG BUCK

Family Portrait

A clan keeps on growing

The photograph above, showing Pedro and Eloisa Soriano in front of their Laredo Street house in San Antonio, Texas, led off the magazine's June 1980 article about Mexican Americans. There were 17 Soriano children, and the family then numbered 68.

About 160 family members gathered at the Laredo Street house last fall to celebrate the 61st wedding anniversary of Pedro, 83, and Eloisa, 76, again

cradling the clan's two youngest members in their laps (above), just weeks before Eloisa's death. Another 40 couldn't make it.

One of the 17 children has died since the original photograph appeared, but the surviving eight brothers and eight sisters remain close. All but five still live in and around San Antonio. "Anybody

needs anything, we're there," says Natalia Soriano Tovar. "My parents taught us to share." Growing up, the kids shared a long bedroom, "like a barracks, with a lot of twin beds," Natalia says. No, she adds, they didn't think of themselves as unusual; an uncle's family, after all, included 20 children.

100 YEARS AGO



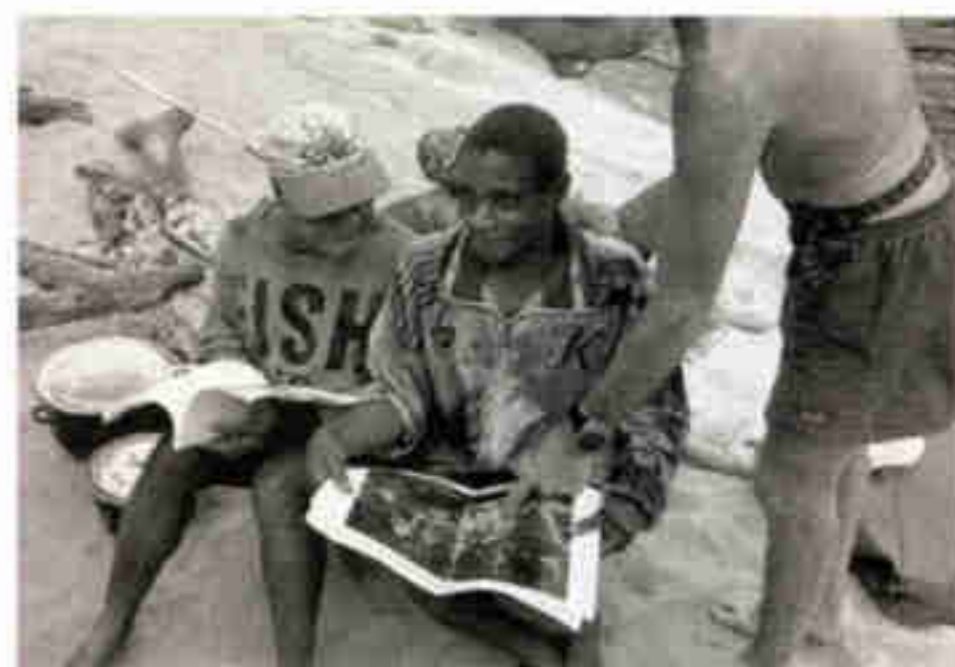
March 1901

"Michael seemed to have gotten close to only one camel. That one had managed, even with its soft pad, to kick Michael's shin into collapse and make him mourn the difference, which he declared to be well marked, between the Somali camels and his humped brother of Asia Minor and Egypt."

—From "Abyssinia—The Country and People," by Oscar T. Crosby

Old Ways Mourned

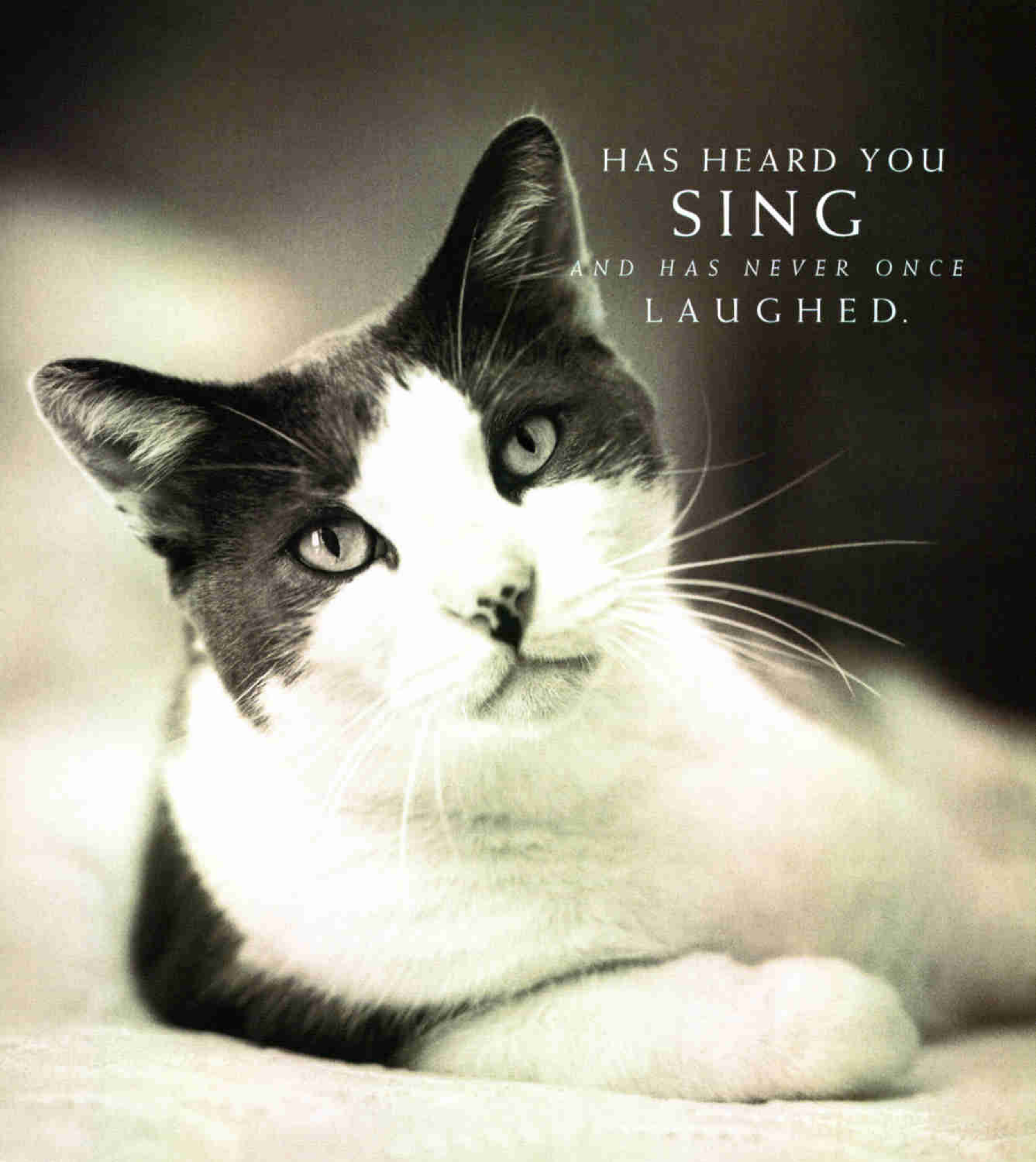
Unlike Congo's Bambendjellé Pygmies, Gabon's Baka Pygmies have seen their traditions give way to Western culture, due to logging and roadbuilding. When J. Michael Fay (right, at right) showed Yeye Emmanuel, center, and his twin brother, Boba Jean-Jacques, the layout of the first Megatransect article (October), tears of joy and sadness came to the eyes of the two Baka members of Fay's team: They saw evidence that their old ways, including the dances of their youth, live on in Congo. "They miss it," says photographer Michael Nichols. "They're doing great, but they know their culture is dying."



MICHAEL NICHOLS, NGS

FOR MORE INFORMATION

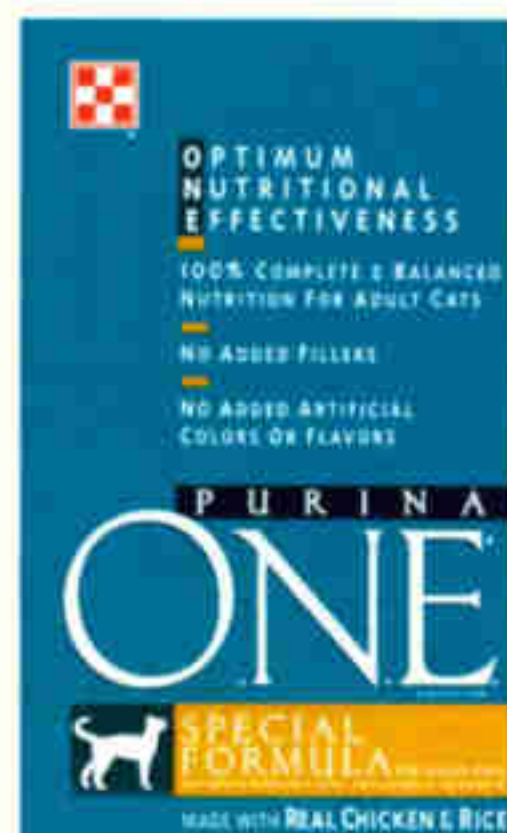
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BUDDY MAYS, CORBIS

Destinations

Crisp air and mountain majesty place Canada's Banff National Park among the many ideal vacation spots featured in Destinations, an invaluable tool for organizing

a trip in the United States or Canada. Driving tours, photographs, lists of popular national parks and historical places, and Web links are part of the wealth of information available at nationalgeographic.com/destinations.

Art of the Tattoo

Elaborate designs proclaim a New Zealand man a member of the Maori people. Tattooing and scarification are used in a host of cultures to signify social status, as protection against misfortune, or merely as decoration. Photographer Chris Rainier reveals eye-catching body art at nationalgeographic.com/tattoos.



CHRIS RAINIER

Creature Feature

Come face-to-face with wild critters in our multimedia bestiary. Fun facts, video clips, sound bites, and postcards give kids an engaging introduction to hippos, cheetahs, koalas, and more. Join the fun at nationalgeographic.com/kids.



BEVERLY JOUBERT

A lot of guys have occasional erection problems.



- VIAGRA has shown improvement in erectile function in 4 out of 5 men compared with 1 out of 4 for sugar tablets
- More than 17 million prescriptions written in the United States*
- Effective and well tolerated in a variety of patients
- More than 6 million men in the US have been prescribed VIAGRA (1 million were also taking blood pressure-lowering medication)

I chose not to accept mine and asked about VIAGRA.

VIAGRA is not for everyone. Be sure to ask your doctor if your heart is healthy enough to handle the extra strain of sexual activity. If you have chest pains, dizziness, or nausea during sex, stop and immediately tell your doctor.

If you're a man who uses nitrate drugs, never take VIAGRA—your blood pressure could suddenly drop to an unsafe level. With VIAGRA, the most common side effects are headache, facial flushing, and upset stomach. VIAGRA may also briefly cause bluish vision, sensitivity to light, or blurred vision. In the rare event of an erection lasting more than 4 hours, seek immediate medical help. Remember to protect yourself and your partner from sexually transmitted diseases.

Please see patient summary of information about VIAGRA (25-mg, 50-mg, 100-mg) tablets on the following page.

*Data on file. Pfizer Inc, New York, NY.

Ask your doctor if a FREE TRIAL of VIAGRA is right for you. For more information, call 1-888-4VIAGRA or visit www.viagra.com.

VIAGRA[®]
(sildenafil citrate) tablets
Love life again.



PATIENT SUMMARY OF INFORMATION ABOUT

VIAGRA®
(sildenafil citrate) tablets

This summary contains important information about VIAGRA®. It is not meant to take the place of your doctor's instructions. Read this information carefully before you start taking VIAGRA. Ask your doctor or pharmacist if you do not understand any of this information or if you want to know more about VIAGRA.

This medicine can help many men when it is used as prescribed by their doctors. However, VIAGRA is not for everyone. It is intended for use only by men who have a condition called erectile dysfunction. **VIAGRA must never be used by men who are taking medicines that contain nitrates of any kind, at any time. This includes nitroglycerin. If you take VIAGRA with any nitrate medicine your blood pressure could suddenly drop to an unsafe or life threatening level.**

What Is VIAGRA?

VIAGRA is a pill used to treat erectile dysfunction (impotence) in men. It can help many men who have erectile dysfunction get and keep an erection when they become sexually excited (stimulated).

You will not get an erection just by taking this medicine. VIAGRA helps a man with erectile dysfunction get an erection only when he is sexually excited.

How Sex Affects the Body

When a man is sexually excited, the penis rapidly fills with more blood than usual. The penis then expands and hardens. This is called an erection. After the man is done having sex, this extra blood flows out of the penis back into the body. The erection goes away. If an erection lasts for a long time (more than 6 hours), it can permanently damage your penis. You should call a doctor immediately if you ever have a prolonged erection that lasts more than 4 hours.

Some conditions and medicines interfere with this natural erection process. The penis cannot fill with enough blood. The man cannot have an erection. This is called erectile dysfunction if it becomes a frequent problem.

During sex, your heart works harder. Therefore sexual activity may not be advisable for people who have heart problems. Before you start any treatment for erectile dysfunction, ask your doctor if your heart is healthy enough to handle the extra strain of having sex. If you have chest pains, dizziness or nausea during sex, stop having sex and immediately tell your doctor you have had this problem.

How VIAGRA Works

VIAGRA enables many men with erectile dysfunction to respond to sexual stimulation. When a man is sexually excited, VIAGRA helps the penis fill with enough blood to cause an erection. After sex is over, the erection goes away.

VIAGRA Is Not for Everyone

As noted above (*How Sex Affects the Body*), ask your doctor if your heart is healthy enough for sexual activity.

If you take any medicines that contain nitrates—either regularly or as needed—you should never take VIAGRA. If you take VIAGRA with any nitrate medicine or recreational drug containing nitrates, your blood pressure could suddenly drop to an unsafe level. You could get dizzy, faint, or even have a heart attack or stroke. Nitrates are found in many prescription medicines that are used to treat angina (chest pain due to heart disease) such as:

- nitroglycerin (sprays, ointments, skin patches or pastes, and tablets that are swallowed or dissolved in the mouth)
- isosorbide mononitrate and isosorbide dinitrate (tablets that are swallowed, chewed, or dissolved in the mouth)

Nitrates are also found in recreational drugs such as amyl nitrate or nitrite ("poppers"). If you are not sure if any of your medicines contain nitrates, or if you do not understand what nitrates are, ask your doctor or pharmacist.

VIAGRA is only for patients with erectile dysfunction. VIAGRA is not for newborns, children, or women. Do not let anyone else take your VIAGRA. VIAGRA must be used only under a doctor's supervision.

What VIAGRA Does Not Do

- VIAGRA does not cure erectile dysfunction. It is a treatment for erectile dysfunction.
- VIAGRA does not protect you or your partner from getting sexually transmitted diseases, including HIV—the virus that causes AIDS.
- VIAGRA is not a hormone or an aphrodisiac.

What To Tell Your Doctor Before You Begin VIAGRA

Only your doctor can decide if VIAGRA is right for you. VIAGRA can cause mild, temporary lowering of your blood pressure. You will need to have a thorough medical exam to diagnose your erectile dysfunction and to find out if you can safely take VIAGRA alone or with your other medicines. Your doctor should determine if your heart is healthy enough to handle the extra strain of having sex.

Be sure to tell your doctor if you:

- have ever had any heart problems (e.g., angina, chest pain, heart failure, irregular heart beats, or heart attack)
- have ever had a stroke
- have low or high blood pressure

- have a rare inherited eye disease called retinitis pigmentosa
- have ever had any kidney problems
- have ever had any liver problems
- have ever had any blood problems, including sickle cell anemia or leukemia
- are allergic to sildenafil or any of the other ingredients of VIAGRA tablets
- have a deformed penis, Peyronie's disease, or ever had an erection that lasted more than 4 hours
- have stomach ulcers or any types of bleeding problems
- are taking any other medicines

VIAGRA and Other Medicines

Some medicines can change the way VIAGRA works. Tell your doctor about **any medicines** you are taking. Do not start or stop taking any medicines before checking with your doctor or pharmacist. This includes prescription and nonprescription medicines or remedies. Remember, VIAGRA should never be used with medicines that contain nitrates (see *VIAGRA Is Not for Everyone*). If you are taking a protease inhibitor, your dose may be adjusted (please see *Finding the Right Dose for You*.) VIAGRA should not be used with any other medical treatments that cause erections. These treatments include pills, medicines that are injected or inserted into the penis, implants or vacuum pumps.

Finding the Right Dose for You

VIAGRA comes in different doses (25 mg, 50 mg and 100 mg). If you do not get the results you expect, talk with your doctor. You and your doctor can determine the dose that works best for you.

- Do not take more VIAGRA than your doctor prescribes.
- If you think you need a larger dose of VIAGRA, check with your doctor.
- VIAGRA should not be taken more than once a day.

If you are older than age 65, or have serious liver or kidney problems, your doctor may start you at the lowest dose (25 mg) of VIAGRA. If you are taking protease inhibitors, such as for the treatment of HIV, your doctor may recommend a 25 mg dose and may limit you to a maximum single dose of 25 mg of VIAGRA in a 48 hour period.

How To Take VIAGRA

Take VIAGRA about one hour before you plan to have sex. Beginning in about 30 minutes and for up to 4 hours, VIAGRA can help you get an erection if you are sexually excited. If you take VIAGRA after a high-fat meal (such as a cheeseburger and french fries), the medicine may take a little longer to start working. VIAGRA can help you get an erection when you are sexually excited. You will not get an erection just by taking the pill.

Possible Side Effects

Like all medicines, VIAGRA can cause some side effects. These effects are usually mild to moderate and usually don't last longer than a few hours. Some of these side effects are more likely to occur with higher doses. The most common side effects of VIAGRA are headache, flushing of the face, and upset stomach. Less common side effects that may occur are temporary changes in color vision (such as trouble telling the difference between blue and green objects or having a blue color tinge to them), eyes being more sensitive to light, or blurred vision.

In rare instances, men have reported an erection that lasts many hours. You should call a doctor immediately if you ever have an erection that lasts more than 4 hours. If not treated right away, permanent damage to your penis could occur (see *How Sex Affects the Body*).

Heart attack, stroke, irregular heart beats, and death have been reported rarely in men taking VIAGRA. Most, but not all, of these men had heart problems before taking this medicine. It is not possible to determine whether these events were directly related to VIAGRA.

VIAGRA may cause other side effects besides those listed on this sheet. If you want more information or develop any side effects or symptoms you are concerned about, call your doctor.

Accidental Overdose

In case of accidental overdose, call your doctor right away.

Storing VIAGRA

Keep VIAGRA out of the reach of children. Keep VIAGRA in its original container. Store at room temperature, 59°-86°F (15°-30°C).

For More Information on VIAGRA

VIAGRA is a prescription medicine used to treat erectile dysfunction. Only your doctor can decide if it is right for you. This sheet is only a summary. If you have any questions or want more information about VIAGRA, talk with your doctor or pharmacist, visit www.viagra.com, or call 1-888-4VIAGRA.

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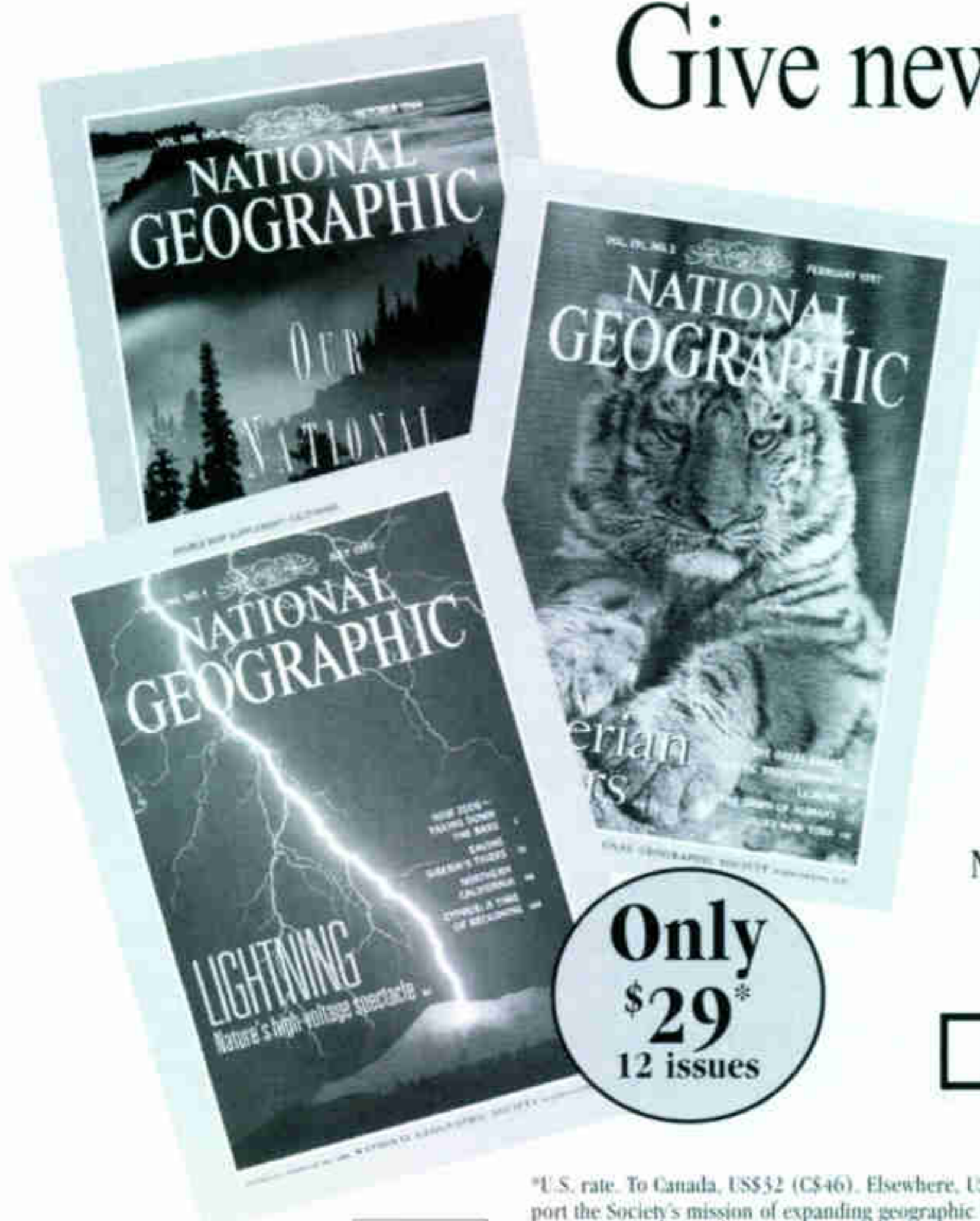
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MARCH 18, 8 P.M. ET/PT

African Epic

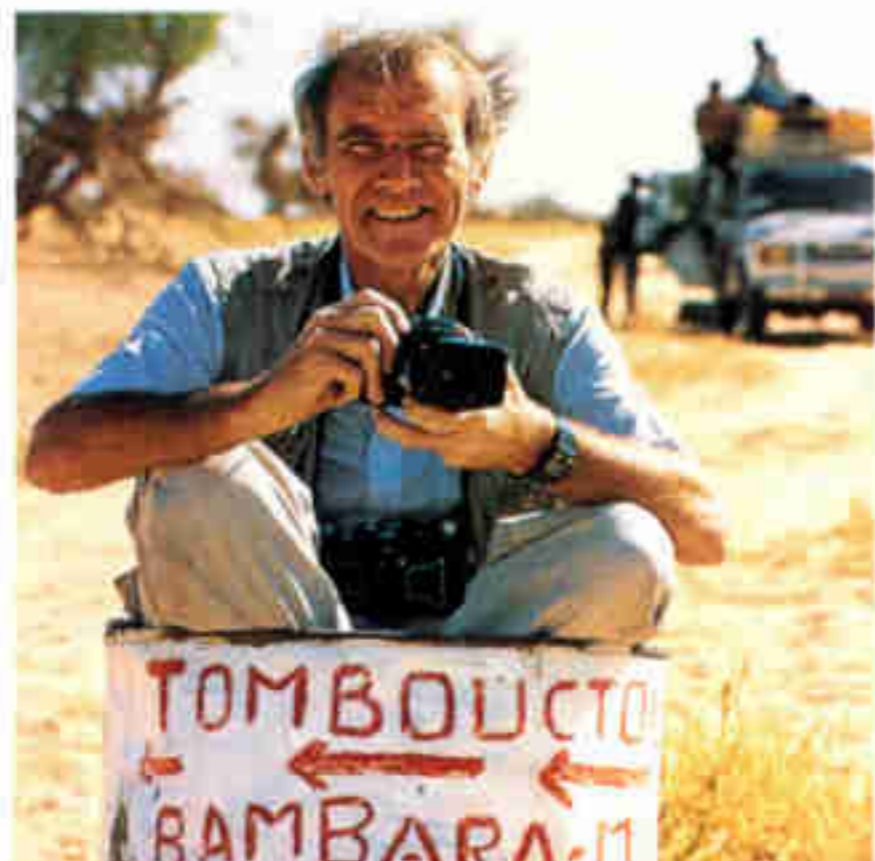
Unused to humans, a sitatunga, a water-loving antelope, peers from the brush in Odzala National Park in the Republic of the Congo, a way-stop on ecologist J. Michael Fay's trek across central Africa. *Africa Extreme* documents vivid encounters with gorillas and other threatened wildlife. Profiling scientists and local residents, the film joins the urgent debate on how to save an unmatched wilderness.

NATIONAL GEOGRAPHIC PHOTOGRAPHER MICHAEL NICHOLS

NATIONAL GEOGRAPHIC
CHANNEL, MARCH 4

On the Road

From here to Timbuktu, the trials and adventures of Geographic shooters like Jim Stanfield (below) are chronicled in *The Photographers*, part of the Channel's Sunday night signature series, *National Geographic Presents*.



ED GEORGE (ABOVE); THOMAS J. ABERCROMBIE

NATIONAL GEOGRAPHIC CHANNEL, MARCH 19-23

Snakes, Snakes, Snakes

Wrapped up in his work, National Geographic research grantee Jesús Rivas gets some help lugging a 13-foot anaconda from a flooded savanna in Venezuela. Rivas's pioneering research on the world's largest snake is the centerpiece of *Land of the Anaconda*, airing during *5 Days of Snakes*, a marathon devoted to lifestyles of the slithery.

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AskUs



TELL US

How many lightbulbs does it take to illuminate India's Mysore Palace?

Think you know the answer? Go online to nationalgeographic.com/ngm/tellus/0103 and test yourself, or read it here in next month's issue.

February Answer Heart Reef, part of Australia's Great Barrier Reef, is made of coral.

SUDHIR RAMCHANDRAN

THE ANSWER PLACE

Our Research Correspondence staff responds to questions from curious readers.

Q How far will a yellow jacket travel from its nest for food?

A It may travel up to three-quarters of a mile if it's a *Vespa germanica*, common in New Zealand. Others, like most of the world's approximately 1,000 species of social wasps, generally forage within a few hundred yards of the nest.

Q What makes distant mountains appear blue when up close they're green or brown?

A The gas molecules in air scatter light waves. Short wavelengths—blue light—are scattered the most, giving distant mountains a bluish cast.

Q Is it true that water drains one way in the Northern Hemisphere and the other way in the Southern?

A In most cases, no. If all other factors are nullified, however, the Coriolis force—produced by the Earth's spin—comes into play and makes draining water spiral counterclockwise north of the Equator and the other way down under. But the Coriolis force is extremely weak on small systems like a basin of

water. The direction from which water enters the basin, the shape of the basin, or any external movement can outweigh the Coriolis force in determining the direction water drains.

MORE INFORMATION

Send questions to Ask Us, National Geographic Magazine, PO Box 96095, Washington, DC 20090-6095 or via the Internet to ngsaskus@nationalgeographic.com. Include name, address, and daytime phone number.

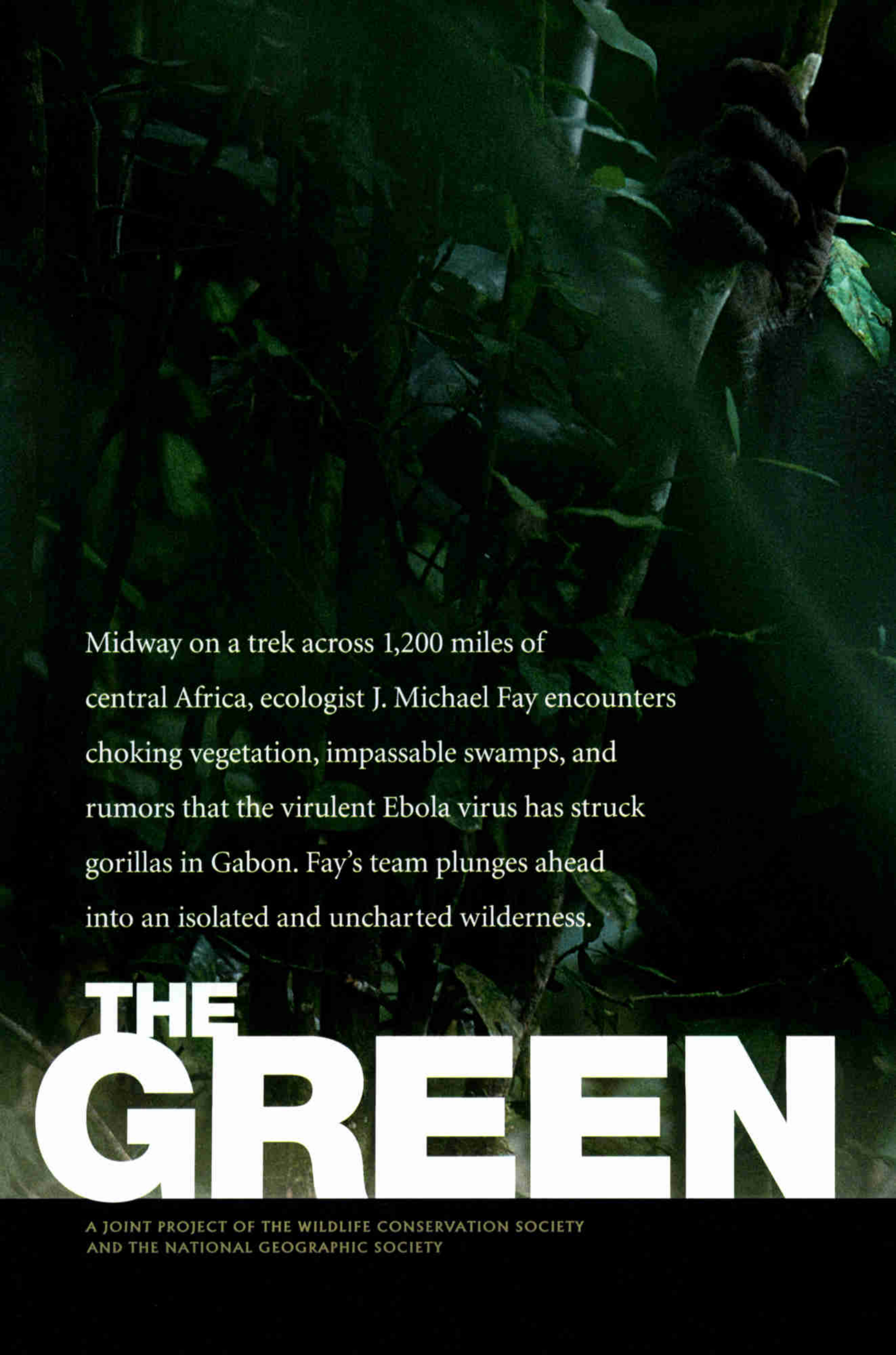


CARTOGRAPHIC

Q Does the Arctic Circle move from year to year?

A Yes. Shifts in the Earth's tilt cause the Arctic Circle—the latitude farthest from the Pole with at least one 24-hour period of daylight a year—to move as much as 50 feet annually.

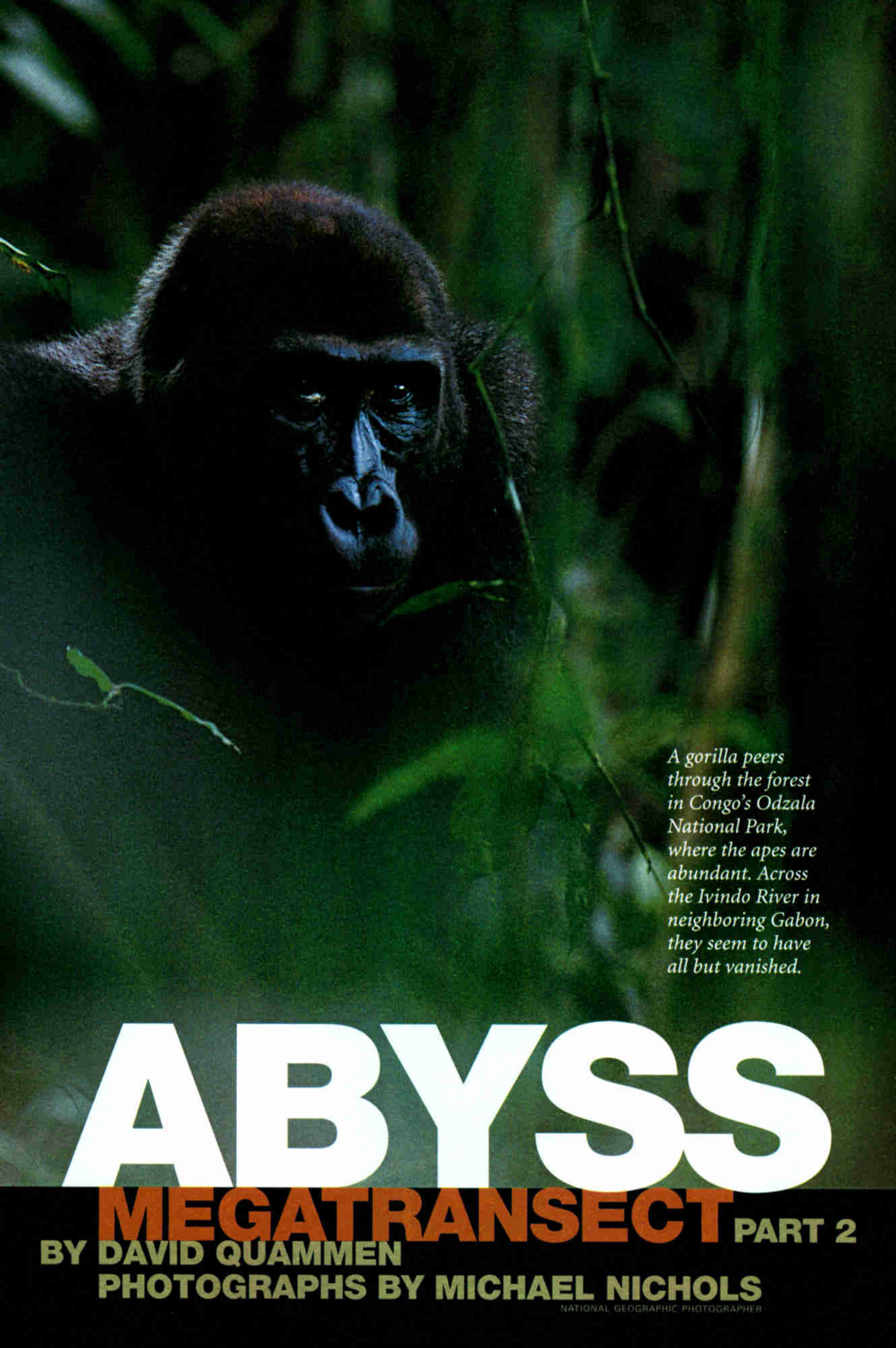
NG MAPS



Midway on a trek across 1,200 miles of central Africa, ecologist J. Michael Fay encounters choking vegetation, impassable swamps, and rumors that the virulent Ebola virus has struck gorillas in Gabon. Fay's team plunges ahead into an isolated and uncharted wilderness.

THE GREEN

A JOINT PROJECT OF THE WILDLIFE CONSERVATION SOCIETY
AND THE NATIONAL GEOGRAPHIC SOCIETY



A gorilla peers through the forest in Congo's Odzala National Park, where the apes are abundant. Across the Ivindo River in neighboring Gabon, they seem to have all but vanished.

ABYSS

MEGATRANSECT PART 2

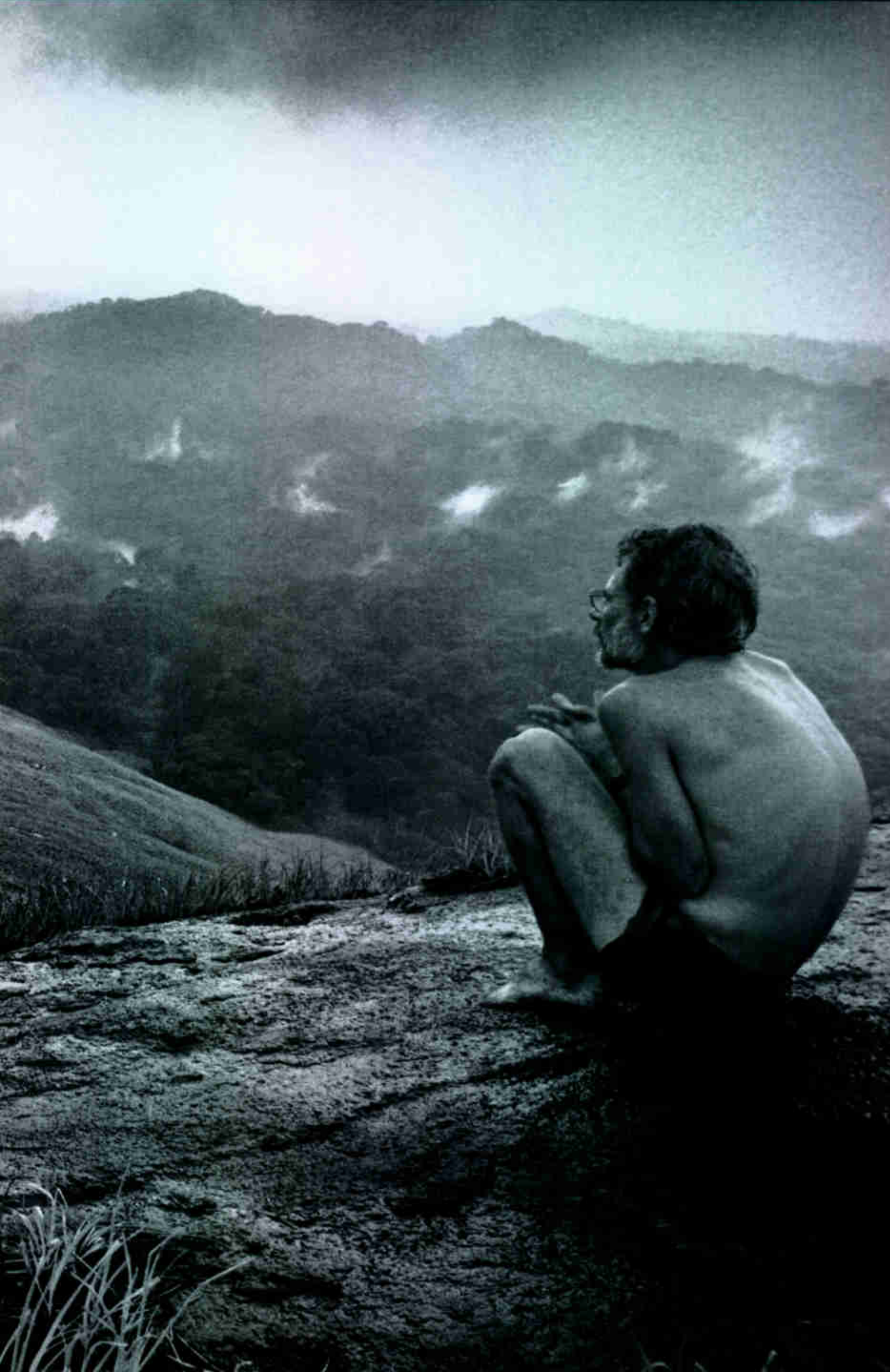
BY DAVID QUAMMEN

PHOTOGRAPHS BY MICHAEL NICHOLS

NATIONAL GEOGRAPHIC PHOTOGRAPHER

**HE HAD BEGUN TO
REMINDE ME OF A HALF-MAD,
HALF-BRILLIANT MILITARY
COMMANDER GONE
AWOL INTO WARS OF
HIS OWN CHOOSING.**





After nine months beneath the dense jungle canopy, Fay huddles on the granite back of a mountain, surveying the surrounding ocean of trees. A chain of these rock outcrops in Minkébé forest marked the journey's most remote point, 45 miles from the nearest village. Ascending the highest dome, Fay wrote: "I have been to the mountaintop."



Forest buffalo charge along a tangle of muddy paths, scattering a cloud of egrets in Odzala National Park. Some 3,000 buffalo roam the park's forest, clearings, and savanna—a mosaic of habitats that supports one of the largest wildlife concentrations in central Africa.



It takes a hardheaded person to walk 1,200 miles across west-central Africa, transecting all the wildest forests remaining between a northeastern corner of the Republic of the Congo and the Atlantic. It takes a harder head still to conceive of covering that terrain in a single, sustained, expeditionary trudge. There are rivers to be ferried or

bridged, swamps to be waded, ravines to be crossed, vast thickets to be carved through by machete, and one tense national border, as well as some lesser impediments—thorny vines, biting flies, stinging ants, ticks, vipers, tent-eating termites, foot worms, not a few nervous elephants, and the occasional armed poacher. As though that weren't enough, there's a beautifully spooky forest about midway on the route that's believed to harbor the Ebola virus, cause of lethal epidemics in nearby villages within recent years. The logistical costs of an enterprise on this scale, counting high-tech data-gathering gizmos and aerial support, can run to hundreds of thousands of dollars. The human costs include fatigue, hunger, loneliness, tedium, some diseases less mysterious than Ebola, and the inescapable nuisance of infected feet. It takes an obdurate self-confidence to begin such a journey, let alone finish it. It takes an unquenchable curiosity and a monomaniacal sense of purpose.

J. Michael Fay, an American ecologist employed (on a long tether) by the Wildlife Conservation Society in New York, is as obdurate and purposeful as they come.* But even for him there arrived a moment, after eight months of walking, when it looked as if the whole adventure would end sadly. One of his forest crew, a young Bambendjellé Pygmy named Mouko, lay fevering on the verge of death. Hepatitis was taking him down fast.

Mouko's illness was only the latest travail. Within recent days Fay had been forced to backtrack around an impassable swamp. His 12 Bambendjellé crewmen, even the healthy

ones, were exhausted and ready to quit. That border crossing, which loomed just ahead, had begun to appear politically problematic—no Gabonese visas for a gang of Congolese Pygmies. And then a Muslim trader went missing between villages along one of the few human footpaths with which Fay's route converged; as authorities reacted to the disappearance, Fay began dreading the prospect that he and his feral band might come under suspicion and be sidetracked for questioning. Suspending the march to nurse Mouko, he found himself stuck in a village with bad water. He was running short of food, with not even enough pocket money to buy local bananas. The Megatransect was in megatrouble.

If Mouko dies, Fay thought, it's probably time to roll up the tents and capitulate. He would abandon his dream of amassing a great multidimensional filament of forest-survey data, continuous both in space and in time. He would stop recording all those little particulars—the relative freshness of every pile of elephant dung, the location of every chimp nest and aardvark burrow, the species and girth of every big tree—in the latest of his many yellow notebooks. He would stop walking. Human exigencies would preempt methodological imperatives and vaulting aspirations. If Mouko dies, he figured, I'll drop everything and take the body home.

Even from the start, in late September of 1999, it looked like a daunting endeavor—far too arduous and demented to tempt an ordinary tropical ecologist, let alone a normal human being. But Fay isn't ordinary. By his standards, the first three months of walking were a lark. Then the going got sticky.

*See Part 1 of "Megatransect," NATIONAL GEOGRAPHIC, October 2000.

Having crossed Nouabalé-Ndoki National Park and a stunning wedge of pristine forest known as the Goualougo Triangle, having hiked south through the trail-gridded timber concessions and boomtown logging camps of the lower Ndoki watershed, Fay and his team angled west, toward a zone of wilderness between the Sangha and the Lengoué Rivers, both of which drain south to the main stem of the Congo. What was out there? No villages, no roads. On the national map it was just a smear of green. Fay traveled along elephant trails when possible, and when there were none, he bushwhacked, directing his point man to cut a compass-line path by machete.

A strong-armed and equable Pygmy named Mambeleme had laid permanent claim to the point-man job. Behind him walked Fay with his yellow notebook and video camera, followed closely by Yves Constant Madzou, the young Congolese biologist serving as his scientific apprentice. Farther back, beyond earshot so as not to spook animals, came the noisier

**WHAT WAS OUT THERE?
NO VILLAGES, NO ROADS.
ON THE NATIONAL
MAP IT WAS JUST
A SMEAR OF GREEN.**

and more heavily burdened entourage—12 Pygmy porters and a Bakwele Bantu named Jean Gouomoth, nicknamed Fafa, Fay's all-purpose expedition sergeant and camp cook. They had proceeded that way for many weeks, in a good rhythm, making reasonable distance for reasonable exertion, when gradually they found themselves submerged in a swale of vegetation unlike anything Fay had ever seen.

Trained as a botanist long before he did his doctoral dissertation on gorillas, Fay describes it as "a solid sea of Marantaceae"—the family Marantaceae constituting a group of herbaceous tropical plants that includes gangly species such as *Haumania liebrechtsiana*, which can grow into stultifying thickets, denser than sugar cane, denser than grass, dense as the fur on a duck dog. The Marantaceae brake that Fay and his team had now entered, just east of the Sangha, stretched westward for God-knew-how-far. Fay himself, with a GPS unit and a half-decent map but no godlike perspective,

knew not. All he could do was point Mambeleme into the stuff, like a human Weedwacker, and fall in behind.

Sometimes they moved only 60 steps an hour. During one ten-hour day they made less than a mile. The green stems stood 15 feet high, with multiple branches groping crosswise and upward, big leaves turned greedily toward the sun. "It's an environment which is completely claustrophobic," Fay says later, from the comfort of retrospect. "It's like digging a tunnel except there is sunlight." The cut stems scratched at their bare arms and legs. Sizable trees, offering shade, harboring monkeys, were few. Flowing water was rare, and each afternoon they searched urgently for some drinkable sump beside which to camp. When they did stop, it took an hour of further cutting just to clear space for the tents.

On the march Fay spent much of his time bent at the waist, crouching through Mambeleme's tunnel. He learned to summon a Zen-like state of self-control, patience, humility. The alternative was to start hating every stem of this Marantaceae hell, regretting he ever blundered into it—and along that route a person might go completely nuts. Mambeleme and the other Pygmies had their own form of Zen-like accommodation. "*Eyali djamba*," they would say. "*Njamba, eyaliboyé*." That's the forest. That's the way it is.

But this wasn't the real forest, woody and canopied and diverse, that Mike Fay had set out to explore. It was something else, an awesome expanse of reedy sameness. Later he named it the Green Abyss.

They reached the Sangha River, crossed in borrowed pirogues, then plunged westward into more of the same stuff. Fay had flown this whole route in his Cessna, scouting it carefully, but even at low elevation he hadn't grasped the difficulty of getting through on foot. Villagers on the Sangha, whose own hunting and fishing explorations had taught them to steer clear of that trackless mess, warned him: "It's impossible; you cannot do it. You will fail. You will be back here soon." Fay's response was: "We have maps. We have a compass, and we have strong white-man medicine. We will make it." He was right. But it took ten miserable weeks. Having spent New Year's Eve in the Green Abyss, he wouldn't emerge until early March.

"We drank swamp water for three weeks in

a row. We did not see any flowing water for almost a month," Fay recalls. "Miraculously, we only had one night where we had to drink water out of a mudhole." It was an old termite mound, excavated by an aardvark or some other insectivore and lately filled with rain water. The water was thick with suspended clay, grayish brown like latte but tasting more like milk of magnesia.

Food was another problem, since their most recent rendezvous with Fay's logistic-support man, an ever reliable Japanese ecologist named Tomo Nishihara, had been back at the Sangha; they were now days behind schedule and would be on starveling rations long before they reached the next resupply point. So by satellite phone Fay and Tomo arranged an airdrop: 20-kilogram bags of manioc and 50-can cases of sardines dumped without parachutes from a low-flying plane. The drop was a success, despite one parcel's ripping open on a tree limb, leaving a plume of powdered manioc to sift down like snow and 50 sardine cans mooshed together like a crashed Corvair. They binged on the open sardines, then resumed walking.

Other problems were less easily solved. There were tensions and deep glooms. There were days that passed into weeks not just without flowing water but without civil conversation. Not everyone on the team found his own variant of *Njamba, eyaliboyé*. By the time they reached the Lengoué River, Yves Madzou had had enough, and Fay had had enough of his enoughness. By mutual agreement Yves left the Megatransect to pursue, as the saying goes, other interests. He was human, after all.

Fay was Fay. He marched on.

AFTER SIX MONTHS Fay and his crew paused for rest and resupply at a field camp called Ekania, on the upper Mambili River, within another spectacular area of Congolese landscape, Odzala National Park. Odzala is noted for its big populations of forest elephants and gorillas, which show themselves in small meadowy clearings known as *bais*, sparsely polka-dotting the forest. Mineral salts, edible sedges, and other toothsome vegetation at the *bais* attract not just elephants and

gorillas but also forest buffalo, sitatungas, bongo, and red river hogs, sometimes in large groups. Of course Fay wanted to visit the *bais*, which he had scouted by plane but never explored on foot; he also wanted to take the measure of the forest around them.

Odzala's elephants suffered heavily from poaching during the late 1980s and early 1990s, until a conservation program known as ECOFAC, funded by the European Commission, assumed responsibility for managing the park, with a stringent campaign of guard patrols and a guard post on the lower Mambili to choke off the ivory traffic coming downriver. Access deep into Odzala along the Mambili, a chocolaty stream whose upper reaches are narrow and strained by many fallen trees, is still allowed for innocent travelers not carrying tusks. That's how Tomo brought the resupply crates up to Ekania. It was a ten-hour trip by motorized dugout from the nearest grass airstrip, and on this occasion I traveled with him.

Fay, bare-chested and walnut brown, with a wilder mane of graying hair than I remembered, stood on a thatched veranda taking video of us as we docked. Without pulling the camera from his eye, he waved. I can't remember if I waved back; more likely I saluted. He had begun to remind me of a half-mad, half-brilliant military commander gone AWOL into wars of his own choosing, with an army of tattered acolytes attending him slavishly—rather like Brando's version of Conrad's Kurtz in *Apocalypse Now*, only much skinnier.

It was the first time I'd seen Fay since Day 13 of the Megatransect, back in October, when I split off from his forest trek and walked out to a road. Now his shoulder bones stood up like the knobbed back of a wooden chair, suggesting he'd lost 20 or 30 pounds. But his legs were the legs of a marathoner. The quiet, clinical smile still lurked behind his wire glasses. Greeting him again here on Day 182, many hundreds of miles deep in the equatorial outback, I felt like Stanley addressing Dr. Livingstone.

"Every day that I walk," Fay volunteered, "I'm just happier that I did the Megatransect." He said *did* rather than *am doing*, I noticed, though in fact he was only halfway along. Why? Because the advance planning and selling phase had been the most onerous part, I suspected, and the actual walk felt like raking in a poker-game pot. *Aside (Continued on page 22)*

HEART OF THE JUNGLE

The Megatransect route led Mike Fay's team into a vast thicket so dense that the only view was up and the only way forward was to follow the strong arm of the expedition's point man. Mambeleme (right) wore his machete to a sliver hacking a path through tangled vegetation west of the Sangha River. Fay: "He would whack the weeds all day—ten hours—without stopping, without taking a

drink, without eating. He must have chopped a million stems." Fay named the region the Green Abyss: "You cannot go anywhere without chopping—you cannot walk around your tent." Hemmed in, the team began to doubt they would emerge. "One guy didn't say a word for three weeks," Fay recalls. "I started yelling about how terrible it was. And Mambeleme would say, 'Just keep going. We can make it.'"



J. MICHAEL FAY







Fay calls them "towns"—clearings elephants trample out of Odzala's forest as they dig for salt in mineral-rich soil along riverbanks. Fay found many large mammals in such areas, known as baïs, but few in the park's dense vegetation.





An elephant charges photographer Nichols in Odzala before turning aside short of the pirogue. In the early 1990s, when poachers still overran the park, elephants fled humans. Now that a guard post downriver has slowed illegal hunting, the animals are reclaiming their kingdom.



The expedition picks its way through spiny Euphorbia, careful not to damage the fragile thicket, which would take years to grow back in the dry, thin soil of a granite outcrop. In neighboring humid valleys amphibians thrive, including a frog camouflaged in sand. Efforts are under way to protect these ecosystems by placing them in the Minkébé Reserve.

**IT LOOKED LIKE A DAUNTING
ENDEAVOR—FAR TOO
ARDUOUS AND DEMENTED TO
TEMPT AN ORDINARY
ECOLOGIST, LET ALONE A
NORMAL HUMAN BEING.**







Gold miners move pay dirt at Minkébé, one of the few human outposts in the region. Some conservationists fear merchants in such camps encourage poaching by buying ivory, but Fay was surprised to find well-used elephant trails close to the camps.

**WHERE DOES EBOLA LURK
BETWEEN OUTBREAKS?
WHAT SPECIES IN THE
FOREST—A SMALL MAMMAL?
AN INSECT?—SERVES AS ITS
RESERVOIR HOST?**





A mandrill orphaned by a shotgun blast grabs for the camera in a hunting camp where it is tethered on a rope. Ecologist Sally Lahm (above, at rear of line) joined Fay on the edge of the Mingouli forest, hiking into the wilds to discover how far hunters had penetrated. Fay says the forest is disappearing fast. "We're fighting to keep whatever morsel of it we can."

(Continued from page 10) from a chest cold and a few foot-worm infections, and notwithstanding the weight loss, he had stayed healthy. His body seemed to have reached some sort of equilibrium with the rigors of the forest, he said; his feet, I saw, were marked with pinkish scar tissue and pale sandal-strap bands against the weathered brown. No malaria flare-ups, no yellow fever. Just as important, he was having fun—most of the time anyway. He described his ten weeks in the Green Abyss, making clear that *that* passage, far from fun, had been “the most trying thing I’ve ever done in my life.” But now he was in Odzala, lovely Odzala, where the bongo and the buffalo roam. He had a new field companion to help with the botany, a jovial Congolese man named Gregoire Kossa-Kossa, forest hardy and consummately knowledgeable, on loan from the Ministry of Forestry and Fishing. Fafa, his crew boss and cook, had grown into a larger role, which included data-gathering chores earlier handled by Yves. And his point man, Mambeleme, now with a buffed-out right arm and a machete so often sharpened it was almost used up, had proved himself a champion among trail cutters. The rest of Fay’s crew, including the brothers Kati and Mouko, had suffered badly from that chest cold they all caught during a village stop but now seemed fine.

Meanwhile his own data gathering had continued, providing some new and significant impressions of Odzala National Park. For instance, one day in a remote floodplain forest Fay, along with Mambeleme and Kossa-Kossa, had sighted a black colobus monkey, the first record of that rare species within the park. In the famed bays of Odzala he saw plenty of elephants, as he’d expected, but during his long cross-country traverses between one bay and another he found a notable absence of elephant trails and dung, suggesting that a person shouldn’t extrapolate from those bays to an assumption of overall elephant abundance. His elephant-sign tallies, recorded methodically in the current yellow notebook, would complement observations of elephant distribution made by ECOFAC researchers themselves.

Maybe those notebooks would yield other insights too. Maybe the Megatransect wasn’t just an athletic publicity stunt, as his critics had claimed. It occurred to me as an intriguing possibility, not for the first time, that

maybe Mike Fay wasn’t as crazy as he looked.

After a few days at Ekania we set off toward the Mambili headwaters and a large bay called Maya North, near which was another ECOFAC field camp used by elephant researchers and visiting film crews. The usual route to the Maya North camp was upriver along the Mambili, traveling some hours by motorized dugout to a point where ECOFAC workers had cut a good trail. We came the back way, bushwhacking on an overland diagonal. That evening, as we sat by the campfire trading chitchat with several Congolese camp workers, the talk turned to boat travel on the upper Mambili. Well, we didn’t use a boat, Fay mentioned. *You didn’t?* they wondered. *Then how did you get here?* We walked, Fay said. *Walked? All the way from Ekania? There’s no trail.* True but irrelevant, Fay said.

At daybreak on Day 188 we were at the bay, watching 18 elephants in the fresh light of dawn as they drank and groped for minerals in the stream. Some distance from the others stood an ancient female, emaciated, failing, her skull and pelvic bones draped starkly with slack gray skin. Amid the herd was a massive bull, who swept his raised trunk back and forth like a periscope, tasting the air vigilantly for unwelcome scents. He caught ours. There was a subtle shift in mood, then the bull initiated a deliberate, wary leave-taking. One elephant after another waded off toward the far side of the bay, disappearing there into the trees. By sun-up they were gone.

By midday so were we, walking on.

F

FROM THE UPPER MAMBILI, Fay planned to ascend toward an escarpment that forms the divide between the Congo River basin and a lesser system, the Ogooué, which drains to the Atlantic through Gabon. I would peel off again on Day 195, using another resupply rendezvous with Tomo as my chance to exit. As it happened, Tomo needed three boatmen and a chain saw to get his load of supplies that far up the snag-choked Mambili, but going back downriver would be easier, and we figured to reach the airstrip in two days.

On the morning before my departure, Fafa

was laid flat by a malarial fever, so Fay himself oversaw the sorting and packing of new supplies: sacks of manioc and rice and sugar, cans of peanut butter and sardines, bundles of salted fish, big plastic canisters of pepper and dried onions, cooking oil, granola bars, freeze-dried meats, cigarettes for the crew, many double-A batteries, a fresh stack of colorful plastic bowls, and one package of seaweed, recommended by Tomo as a complement to the salted fish. Finally the packs were ready, the tents struck; Fafa rallied from his fever, and I walked along behind Fay and Mambeleme for an hour that afternoon.

Fay and I had agreed where I'd rejoin him next: at an extraordinary set of granite domes, known as inselbergs (or "island mountains"), that rise up like stony gumdrops from a forest in northeastern Gabon. The forest, called Min-kébé, is ecologically rich but microbially menacing; many months earlier, as we knelt over my map on the floor of an office at the National Geographic Society in Washington, D.C., this

AT DAYBREAK ON DAY 188 WE WERE AT THE BAI, WATCHING 18 ELEPHANTS IN THE FRESH LIGHT OF DAWN.

was where Fay had written "Ebola region" in red ink. "We'll meet you on the other side of the continental divide," he told me cheerily now. "On our way to the Atlantic Ocean."

Backtracking on the trail to catch Tomo's boat, I shook hands with Kossa-Kossa, Fafa, and each of the Pygmy crew, thanking them for their good company and support. I was fascinated by these rough-and-ready Pygmies, whom Fay had somehow cajoled and bullied across hundreds of miles, leading them so far from their home forest into an alien landscape, an alien realm of experiences. They had been challenged beyond imagining, stressed fearfully, but so far they hadn't broken; they put me in mind of the sort of Portuguese seamen, uneducated, trusting, adaptable, who must have sailed with Ferdinand Magellan. By way of farewell, I told them in bad Lingala: "*Na kotala yo, na sanza mibalé.*" I'll see you in two months.

I was wrong. It would be three months before Fay reached the inselbergs, an interval

encompassing some of his most hellish times since the Green Abyss. And when I did rejoin him there, Mambeleme and all the others would be gone.

Fay and his team followed the escarpment northward along its crest, a great uplifted rim that may have once marked the bank of an ancient body of water. Kossa-Kossa left the troop, as planned, to return to his real-life duties. The others shifted direction again, heading into a thumb of territory where the Republic of the Congo obtrudes westward against Gabon. They struck toward the Ouaga River and found it defended by a huge swamp, which at first seemed passable but grew uglier as they committed themselves deeper. By insidious degrees, it became a nightmare of raffia palms and giant pandanus standing in four feet of black water and mud, the long pandanus leaves armed with rows of what Fay recalls as "horrid, cat-claw spines." He and the crew spent two nights there in a small cluster of trees, among which they built elevated log platforms to hold their tents above the muck. Pushing forward, Fay saw the route get worse: deeper water, no trees, only more raffia and cat-claw pandanus, five days' distance of such slogging still ahead, with a chance that any rainstorm would raise the water and trap them. Finally he ordered retreat, a rare thing for Fay, and resigned himself to a long detour through a zone for which he had no map.

After circumventing the Ouaga swamp, they converged with a human trail, a simple forest footpath that serves as an important highway linking villages in that northwestern Congo thumb. The footpath brought them to a village called Poumba, where they picked up two pieces of bad news: The Gabonese border crossing would be difficult at best, due to festering discord between local authorities on the two sides, and a Muslim trader who dealt in gold and ivory had vanished along the footpath under circumstances suggesting foul play. From a certain perspective (one that the local gendarmerie might well embrace) the trader's disappearance coincided suggestively with another bit of odd news—a white man with an entourage of Pygmies had materialized from the forest on a transcontinental stroll to count aardvark burrows and elephant dung (so he claimed) and making fast tracks for the Gabonese border. It could look very suspicious,

Fay knew. He felt both eager to move and reluctant to seem panicky. Added to those concerns was another, seemingly minor. For the third time in two weeks one of the Pygmies, Mouko this time, was suffering malaria. But a dose of Quinimax would fix that, Fay thought.

Over the next few days Mouko got weaker. He couldn't lug his pack. At times he couldn't even walk and had to be carried. Evidently it was hepatitis, not malaria, since his urine was dark, the Quinimax brought no improvement, and his eyes were going yellow. Fay slowed the pace and took a turn carrying Mouko's pack. Hiding his uncertainty, he wondered what to do. *All the Pygmies think Mouko is going to die now*, he wrote in his notebook on Day 241. Mouko seemed languid as well as sick, with little will to live, while the others had already turned fatalistic about his death. Fay himself became Mouko's chief nurse. He scolded the crew against sharing Mouko's manioc, using his plate, making cuts on his back to bleed him, and various other careless or well-meant practices that could spread the infection. To the notebook, Fay confided: *I am so sick and tired of being the parent of 13 children, it is too much. Thank god I never had children—way too much of a burden. Solo is the way to go—depend on yourself only. The trouble in a group like this is it's like you're an organism. If one part of you is sick or lost the whole organism suffers.* For another ten days after that entry, Mouko's survival remained in doubt.

They pushed toward Garabinzam, a village near the west end of the footpath, on a navigable tributary of the Ivindo River, which drains into Gabon. On the last day of walking to Garabinzam, the team covered nine miles, Kati carrying Mouko piggyback for most of the way. That evening, Fay wrote: *I need to ship these boys home. You can just tell they are haggard, totally worn out. No matter how good they were they are just going to go down one by one. I would love to keep my friends but I would be betraying them if I made them stay on any longer—it would be unjust.*

Several days later, he departed from his line of march—and from all his resolutions about continuity—to evacuate Mouko downriver by boat. They'd try for a village at the Ivindo confluence, on the Gabonese side; from there, if Mouko survived, he could be moved to a hospital in the town of Makokou. Fafa would

meanwhile escort the others back to their home forest, hundreds of miles east, sparing them from the onward trudge and the unwelcoming border. Fay himself would pick up the hike in Gabon. One stretch of the planned route would remain unwalked—roughly 25 miles, from Garabinzam overland to the border—a rankling gap in the data set, a blemish on the grand enterprise, and a token (this is my view, not his) of Fay's humanity.

Left Garabinzam, all is well, he wrote briskly on May 24, 2000, which in Megatransect numeration was Day 248. But also: *Pygmies didn't say goodbye.*

M

OUKO SURVIVED and went home. Starting from scratch, Fay gathered a new crew from the villages and gold-mining camps of the upper Ivindo region. He found an able young Baka Pygmy named Bebe, with good ears for wildlife and a strong machete arm, who emerged before long as his new point man; he found a new cook and eight other forest-tough Pygmy and Bantu men; he found energy, even enthusiasm, to continue. They set off on a long arc through the Minkébé forest, targeting various points of interest, most dramatic of which were the inselbergs. That's where I next see Fay, on Day 292, when I step out of a chartered helicopter that has landed precariously on one of the smaller mounds.

Skin browner, hair longer and whiter, he looks otherwise unchanged. Same pair of river shorts, same sandals, same dry little smile. I have brought him three pounds of freshly ground dark-roast coffee and a copy of Michael Herr's *Dispatches*, another of the Vietnam War memoirs that he finds fascinating. If he's pleased to see me, for the company, for the coffee, he gives no sign.

At once he begins talking about data. He's been seeing some interesting trends. For instance, the gorillas. It's true, he says—picking up a discussion from months earlier—that there's a notable absence of gorillas in the Minkébé forest. Since crossing the border, he hasn't heard a single chest-beat display and has seen only one pile of gorilla dung. Back in Odzala National Park, over a similar stretch, he'd

have counted three or four *hundred* dung piles. Elephants are abundant; duikers and monkeys and pigs, abundant. But the gorillas are missing. He suspects they were wiped out by Ebola.

The Minkébé forest block, encompassing more than 12,500 square miles of northeastern Gabon, represents one of the great zones of wilderness remaining in central Africa. Much of it stands threatened by logging operations (in the near or midterm future), bush meat extraction such as inevitably accompanies logging, and elephant poaching for ivory. But the Gabonese government has recently taken the admirable step of designating a sizable fraction (2,169 square miles) of that block as Minkébé Reserve, a protected area; and now, in addition, three large adjacent parcels are being considered for possible inclusion. The Gabonese Ministry of Water and Forests, with technical help and gentle coaxing from the World Wildlife Fund, has been studying the farsighted idea that an enlarged Minkébé Reserve might be valuable not just in ecological terms but also

OVER THE NEXT FEW DAYS MOUKO GOT WEAKER. HE COULDN'T LUG HIS PACK. AT TIMES HE COULDN'T EVEN WALK.

in economic ones for its role in the sequestration of carbon. With greenhouse gases and climate change becoming ever more conspicuous as a global concern, maybe other nations and interested parties might soon be willing to compensate Gabon—so goes the logic—for maintaining vast, uncombusted carbon storehouses such as Minkébé.

But before the reserve extension can be approved, on-the-ground assessments must be made. So in the past several years a small group of scientists and forest workers made reconnaissance expeditions into Minkébé—both the original reserve and the proposed extension. They found spectacular zones of forest and swamp, stunning inselbergs, networks of streams, all rich with species and virtually untouched by human presence. They also found—as Mike Fay has been finding—a near-total absence of gorillas and chimpanzees.

It wasn't always so. In 1984 two scientists named Caroline Tutin and Michel Fernandez

published a paper in the *American Journal of Primatology* describing their census of gorilla and chimpanzee populations throughout Gabon. Using a combination of field transects, habitat analysis, and cautious extrapolation, Tutin and Fernandez estimated that at least 4,171 gorillas lived within the Minkébé sector, representing a modest but significant population density. Something seems to have happened between 1984 and now.

It may have happened abruptly in the mid-1990s, when three Ebola epidemics burned through villages and gold camps at the Minkébé periphery, killing dozens of humans. One of those outbreaks occurred in early 1996 at a village called Mayibout II, on the upper Ivindo River. It began with a chimpanzee carcass, found dead in the forest and brought to the village as food. Eighteen people who helped with the skinning, the butchering, the handling of the chimp flesh became sick. Suffering variously from fever, headache, and bloody diarrhea, they were evacuated downriver to the Makokou hospital. Four of them died quickly. A fifth escaped from the hospital, went back to Mayibout II, and died there.

These numbers and facts come from a report published three years later, by Dr. Alain-Jean Georges and a long list of co-authors, in *The Journal of Infectious Diseases*. Although the raw chimp flesh had been infectious, the cooked meat evidently had not; no one got sick, the Georges paper asserted, simply from eating it. But once the disease broke out, there were some secondary cases, one human victim infecting another. By early March, according to the World Health Organization, 37 people had fallen ill, of whom 21 died, for a fatality rate of 57 percent. Then it was over, as abruptly as it started. Around the same time, according to later accounts, dead gorillas were seen in the forest too.

Mike Fay isn't the only knowledgeable person inclined to connect Minkébé's apparent gorilla depauperation with Ebola. Down in the Gabonese capital, Libreville, I heard the same idea from a lanky Dutchman named Bas Huijbregts, associated with the World Wildlife Fund's Minkébé Project, who made some of those reconnaissance hikes through the Minkébé forest, gathering both quantified field data and anecdotal testimony. Gorilla nests, he reported, were

(Continued on page 36)



At day's end Fay's feet are plastered with muck, but open sandals fend off infection better than sodden shoes, Fay avows. On this day he and Bebe, the new point man, located a clear stream to quench the team's thirst, but they once had to settle for water from a milky brown mudhole.



“I NEED TO SHIP THESE BOYS HOME. . . . THEY ARE HAGGARD, TOTALLY WORN OUT. NO MATTER HOW GOOD THEY WERE THEY ARE JUST GOING TO GO DOWN ONE BY ONE.”





While Fay caught up on e-mail in Minkouala, the first village the expedition visited on a main road (above), team members hit the bars in a nearby town. One smashed a mirror and landed in jail. Another needed stitches in his lip after a fight. Fay lectured them when they returned, broke and hungover (left).





They hear it days before they reach it—Kongou Falls, a two-mile-wide expanse of roiling water that thunders through a chain of islands, churning up mountains of foam (following pages). The team halts at the brink (below). Many are nervous; several cannot swim. Gathering their courage, they wade into the rapids, clinging to

branches to reach islands where elephants live. “It was like *Outward Bound*,” Fay says. “If you slip, you’re gone.” At the deepest channels they rope an inflatable raft from shore to shore. Safely across, they resume the trek. Fay hopes that the worst may be over. In Part 3 he and his team journey to Gabon’s Atlantic coast.







(Continued from page 25) drastically less abundant than they had been a decade earlier. About the gorillas themselves, he said: "If you talk to all the fishermen, hunters, gold miners, they all have a similar story. Before there were many—and then they started dying off." The apparent population collapse, not just of gorillas but of chimps too, seemed to coincide with the human epidemics. In a hunting camp just north of the Gabonese border someone showed Huijbregts the grave of a man who, so it was said, had died after eating flesh from a gorilla he'd found dead in the forest.

ISPOKE ALSO with Sally Lahm, an American ecologist who has worked in the region for almost 20 years, studying wildlife and wildlife-human interactions. Lahm has focused especially on the mining camps of the upper Ivindo, where gold comes as precious flecks from buried stream sediments and protein comes as bush meat from the forest. Her study, plus the epidemic events of the mid-1990s, have led her toward Ebola. When the third outbreak occurred, at a logging camp southwest of Minkébé, she went there with several medical people from the Makokou hospital and played a double role, as both nurse and researcher.

"I'm scared to death of Ebola, because I've seen what it can do," Lahm told me. "I've seen it kill people—up close." Fearful or not, she's engrossed by the scientific questions. Where does Ebola lurk between outbreaks? What species in the forest—a small mammal? an insect?—serves as its reservoir host? How does its ecology intersect the ecology of hunters, villagers, and miners? So far, nobody knows.

"It's not a purely human disease," Lahm said. "Humans are the last in the chain of events. I think we should be looking at it as a *wildlife-human* disease." Besides doing systematic field research, she has gathered testimony from hunters, gold miners, survivors of Mayibout II. She has also made field collections of tissue from a whole range of reservoir-candidate species, shipping her specimens off to a virology institute in South Africa for analysis. And she has grown suspicious of one particular species that may be the main transfer agent

between the reservoir host and humans—but she declined to tell me what species that is. She needs to do further work, she explained, before further talk.

On the evening of Day 299, at Fay's campfire, I hear more on this subject from one of his crewmen, an affable French-speaking Bantu named Thony M'Both. *Mayibout deux?* Yes, he was there; he recalls the epidemic well. Yes, it began with the chimpanzee. Some boys had gone hunting with their dogs; they were after porcupine, and they found the chimp, already dead. No, they didn't claim they had killed it. The body was rotting, belly swollen, anyone could tell. Many people helped butcher and cook it. Cook it how? In a normal African sauce. All who ate the meat or touched it got sick, according to Thony. Vomiting and diarrhea. Eleven victims were taken downriver to the hospital—only that many, since there wasn't enough fuel to carry everyone. Eighteen stayed in the village, died there, were buried there. Doctors came up from Franceville (in southern Gabon, site of a medical research institute) wearing their white suits and helmets, but so far as Thony could see, they didn't save anyone. His friend Sophiano Etouck lost six family members, including his sister-in-law and three nieces. Sophiano (another of Fay's crew, also here at the campfire) held one niece in his arms as she died, yet he didn't get sick. Nor did Thony himself. He hadn't partaken of the chimp stew. He doesn't eat chimpanzee or gorilla, Thony avers, implying that's by scruple. Nowadays in Mayibout II, however, *nobody* eats chimpanzee. All the boys who went porcupine hunting that day, they all died, yes. The dogs? No, the dogs didn't die.

The campfire chatter around us has stilled. Sophiano himself, a severe-looking Bantu gold miner with a bodybuilder's physique, a black goatee, a sweet disposition, and an anguished stutter, sits quietly while Thony tells the tale.

I ask one final question: Had he ever before seen such a disease? I'm remembering what I've read about horrible, chain-reaction Ebola episodes, with victims bleeding profusely, organ shutdown, chaos and desperate efforts to nurse or mop up, leading only to further infection. "No," Thony answers blandly. "This was the first time."

Thony's body count differs from the careful report in *The Journal of Infectious Diseases*, so

do some other particulars, yet his eyewitness testimony seems utterly real. He's as scared of Ebola as anybody. If he were inventing, he wouldn't invent the chimpanzee's swollen belly. Added to it all, though, is one fact or factoid that he let drop on the first evening I met him—a detail so garish, so perfectly dramatic, that even having heard it from his lips I'm unsure whether to take it literally. Around the same time as the Mayibout epidemic, Thony told me, he and Sophiano saw a whole pile of gorillas, 13 of them, lying dead in the forest.

Anecdotal testimony, even from eyewitnesses, tends to be shimmery, inexact, unreliable. To say *13 dead gorillas* might actually mean a dozen, or lots, too many for a startled brain to count. To say *I saw them* might mean exactly that or possibly less. *My friend saw them, he's unimpeachable*. Or maybe: *I heard about it on pretty good authority*.

Scientific data are something else. They don't shimmer with poetic hyperbole and ambivalence. They are particulate, quantifiable,

TO SAY 13 DEAD GORILLAS MIGHT ACTUALLY MEAN . . . TOO MANY FOR A STARTLED BRAIN TO COUNT.

firm. Fastidiously gathered, rigorously sorted, they can reveal emergent meanings. This is why Mike Fay is walking across central Africa with a little yellow notebook.

After two weeks of bushwhacking through Ebola's backyard, we emerge from the forest onto a red laterite road. Blinking against the sunlight, we find ourselves in a village called Minkouala, at which the dependable Tomo soon arrives with more supplies. Day 307 ends with us camped in a banana grove behind the house of a local official, flanked by a garbage dump and a gas-engine generator. The crew has been given an evening's furlough, and half of them have caught rides into Makokou to chase women and get drunk. By morning one of the Pygmies will be in jail, having expensively busted up a bar, and Fay will be facing a new round of political hassles, personnel crises, and minor ransom demands, a category of inescapable

chores he finds far less agreeable than walking through swamp. But somehow he will get the crew moving again. He'll plunge away from the red road, diving back into the universe of green. Meanwhile he spends hours in his tent, collating the latest harvest of data on a laptop.

Within the past 14 days, he informs me, we have stepped across 997 piles of elephant dung and not a single dung pile from a gorilla. We have heard zero gorilla chest-beat displays. We have seen zero sprigs of Marantaceae chewed by gorilla teeth and discarded. These are numbers representing as good a measure as now exists of the mystery of Minkébé.

Measuring the mystery is a crucial first step; solving it is another matter.

I make my departure along the laterite road and then by Cessna from the Makokou airstrip. The pilot who has come to chauffeur me is a young Frenchman named Nicolas Kozon, the same fellow who circled the Green Abyss at low altitude while Tomo tossed bombs of manioc and sardines to Fay and the others below. As we point ourselves toward Libreville now, the road and the villages disappear quickly, leaving Nicolas and me with a limitless vista of green. Below us, around us in all directions to the horizon, there's only canopy and more canopy, magisterial and abstract.

Nicolas is both puzzled and amused by the epic daffiness of the Megatransect, and through our crackly headsets we discuss it. I describe the daily routine, the distances made, the swamps crossed, and what Fay faces from here onward. He'll visit the big waterfalls of the Ivindo River, I say, then turn westward. He'll cross the railroad line and two more roads, but otherwise he'll keep to the forest, following his plotted route, staying as far as possible from human settlements. He can do that all the way to the ocean. He'll cross the Lopé Reserve, yes, and then a big block of little-known terrain around the Massif du Chaillu. Another four months of walking, if all goes well. He's skinny but looks strong. He'll cross the Gamba complex of defunct hunting areas and faunal reserves along the coast, south of Port-Gentil, and break out onto the beach. He expects to get there in late November, I say.

With a flicker of smile, Nicolas asks: "And then will he swim to America?" □

MORE ON OUR WEBSITE

Get the latest dispatches from Mike Fay and join our discussion board at nationalgeographic.com/ngm/0103.

THE CLEARING

Perched in a kind of tree house, I view a clearing that draws my subjects from dark forest recesses into intense equatorial sunlight. I spent six weeks at this *bai*, or clearing, in the Republic of the Congo. I came against doctor's orders, recovering from hepatitis but determined to photograph Lokwe III, one

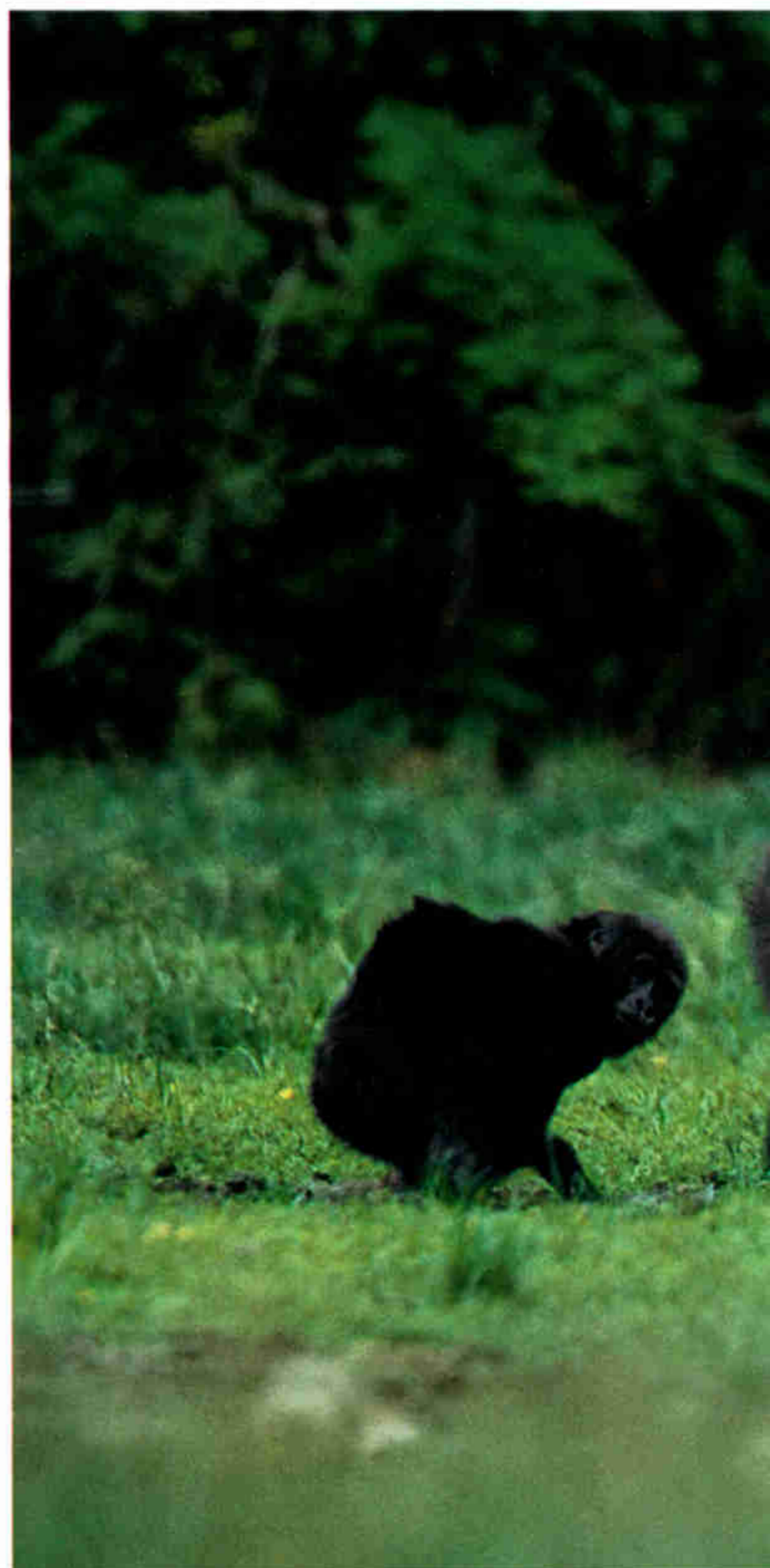
of three bais along the Lokwe River in Odzala National Park. Elephants help keep bais open by clearing trees and churning the forest floor to scoop up mineral-rich earth. Other animals move in to do the same and to graze. I camped far from the bai to avoid spooking the animals with my scent. It paid off when



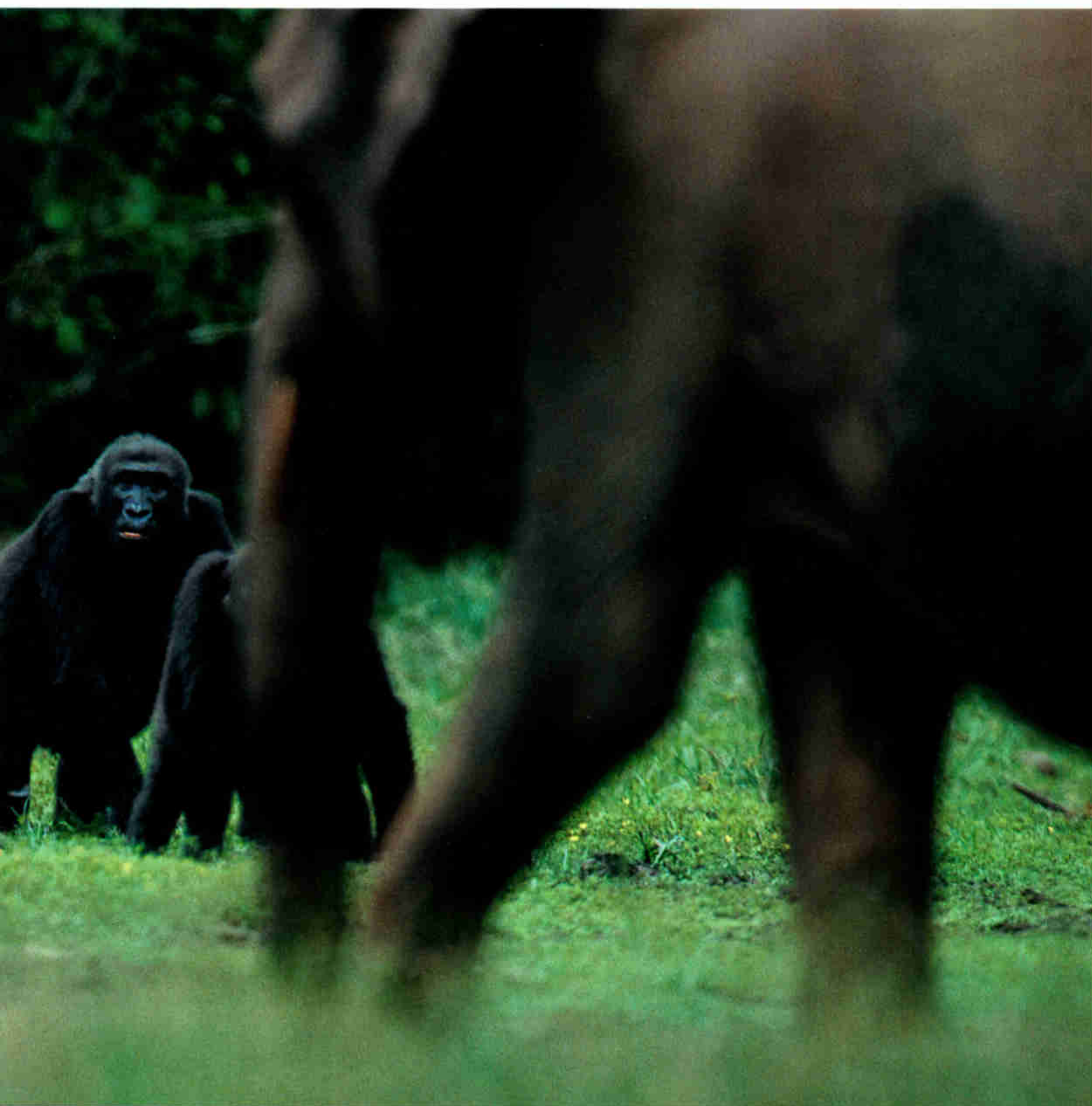
JOHN E. BROWN III

NATIONAL GEOGRAPHIC PHOTOGRAPHER MICHAEL NICHOLS RECORDS AN ISOLATED WILDLIFE SANCTUARY DEEP IN THE CONGOLESE JUNGLE

I watched a mild turf dispute unfold as grazing forest buffalo slowly crowded a western lowland gorilla while a hammerkop jumped to catch an insect (facing page). This grassy clearing in the Republic of the Congo's Odzala National Park attracts a striking array of animals.



I caught a gorilla family warily watching an elephant (below). I rose daily at 4:30 a.m. and fired up my stove to make strong coffee and instant oatmeal. I then faced an adrenaline-pumping walk through thick foliage where potentially dangerous encounters with animals were always on my mind.



ENDLESS WILD PARADE

I know well the risk in facing a charging elephant or a defensive male gorilla or a jungle cat. It was safer to announce my presence than to surprise an animal and provoke an attack. So I had a routine: "Here I come, Mr. Gorilla!" I'd call out loudly as I clapped my hands. "I don't mean you any harm!"

Arriving at the bai, I'd camouflage myself on the ground or climb 35 feet to my hide, or

blind, where I'd spend up to ten hours watching and waiting. On slow days I'd read suspense novels and snack on nuts and candy bars. Sometimes I'd nod off, then curse myself for missing an elephant's majestic entrance. When a bongo sprinted into the bai, I reflexively tripped the shutter to catch a creature very rare in this region (below).

Returning to camp, I'd organize my notes,




cook a freeze-dried meal, and collapse into a dead sleep by 7:30. I once awoke to find millions of carnivorous driver ants covering my tent and the ground outside. I sealed the tent zipper, waited for help, and read. Aides who tended camp while I was away arrived on schedule six hours later. They doused the ants with pails of water, routing them back toward the forest.



Gorging on frogs, a hammerkop gobbles a wriggling meal (top). A mother elephant bolted with her calf when she caught my scent. A Nile monitor frequently showed up, passing by in its search for bird eggs, insects, snakes, or snails, which it crunches and swallows like popcorn.





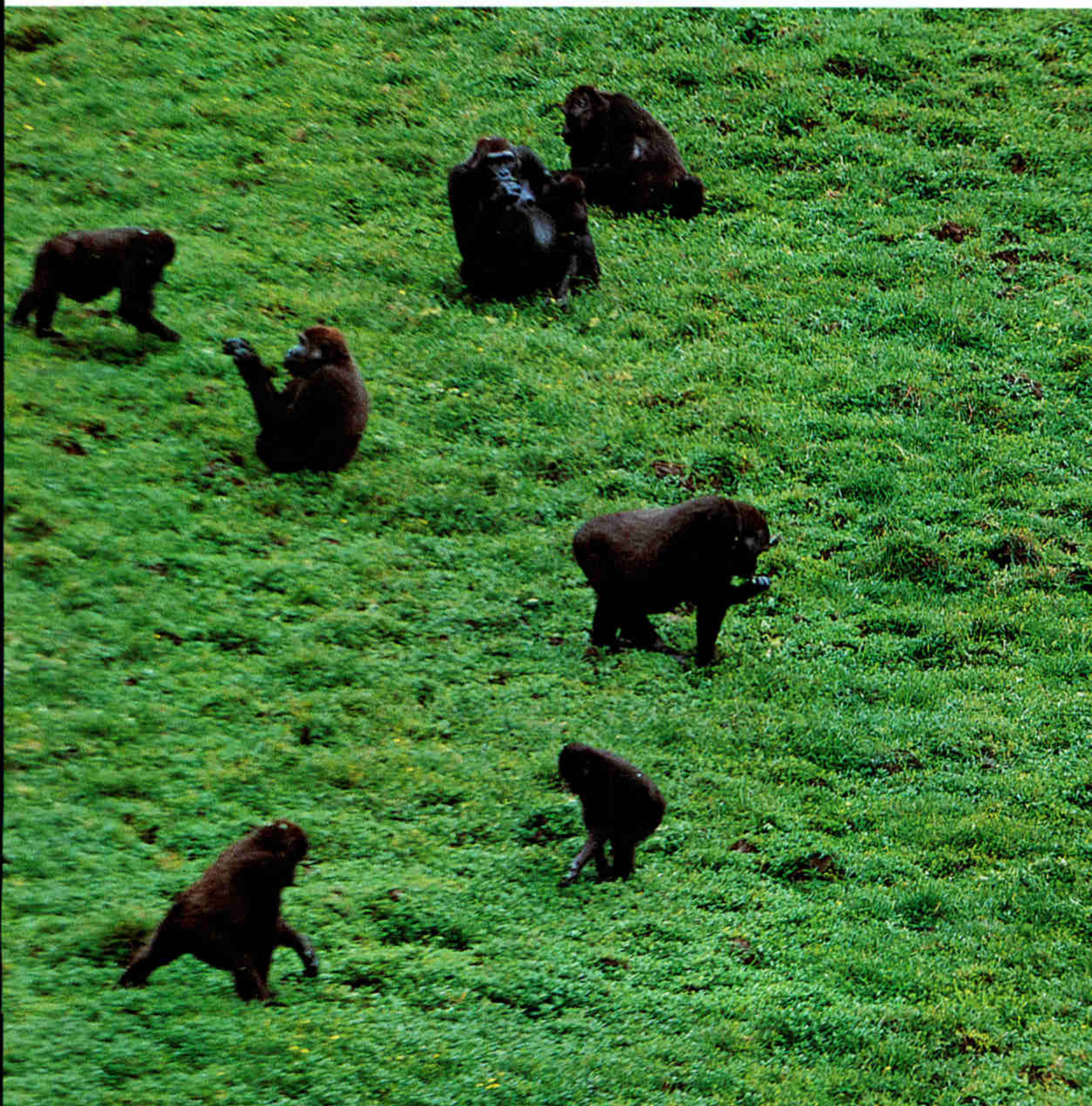
Striking a display to intimidate a nearby rival, a silverback stirs up butterflies drawn here by salt-rich animal urine. The two primates were unaware or unconcerned that a third primate—me—was watching.

GATHERING OF GORILLAS

The bai is a kind of village green for gorillas, a place to feed, play, groom, and just hang out (below). I'm not a primatologist, but I feel I recorded a valid census by using the methods of primatologist Richard Parnell. By noting such data as color, the shape of the brow, ear notches, and scars, he says, "you begin to develop a feel for individuals and are able to recognize a gorilla in the same way you might

a friend in the street." I peg the number at well above 300, which would put Lokwe III among the largest concentrations of western lowland gorillas anywhere. Their chances of survival improved thanks to the conservation program ECOFAC. Its personnel, who spotted all three Lokwe bais from the air, helped stamp out poaching in this part of the park.

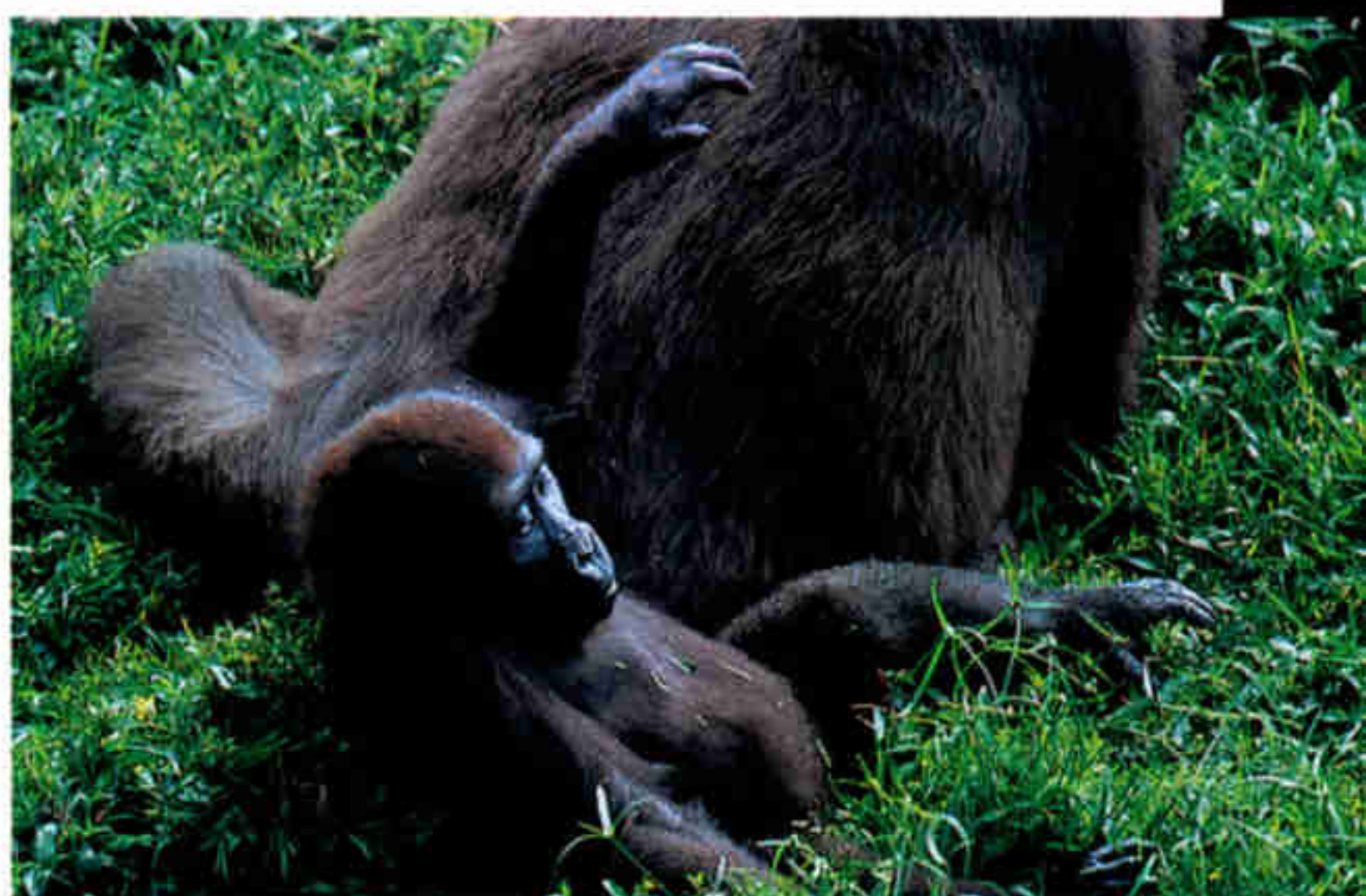
In late 2000 I traveled to the Petit-Loango



Faunal Reserve, a sanctuary on the coast of Gabon where elephants amble along the oceanfront and gorillas graze near the water. Then I prepared to head inland to rendezvous with Michael Fay and David Quammen for the third and last leg of our journey from deepest forest to the sea. □

MORE ON OUR WEBSITE

See and hear an interview with photographer Michael Nichols at nationalgeographic.com/ngm/0103.



Gently reaching for its mother, a young gorilla luxuriates in its grassy domain (top). A disease, perhaps yaws, disfigured the face of a gorilla that ran screaming into the forest when it spotted me. Another displayed an amusing habit of feeding with its leg poised in midair.

The Treasured

*Nature's
Stronghold
in the Pacific*

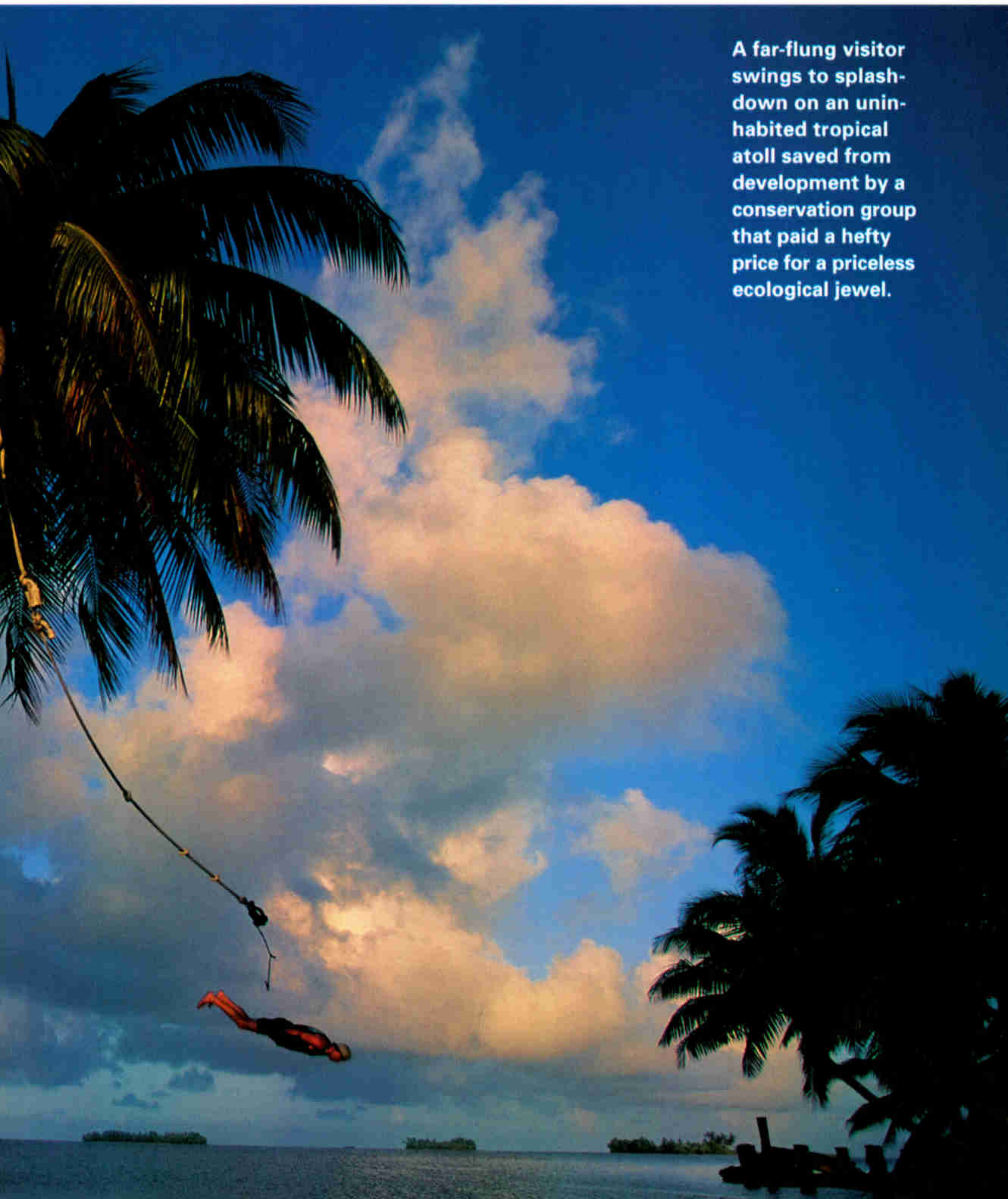
*By Alex
Chadwick*

*Photographs by
Randy Olson*



Islands of Palmyra

A far-flung visitor swings to splash-down on an uninhabited tropical atoll saved from development by a conservation group that paid a hefty price for a priceless ecological jewel.



I n theory, a Pacific paradise doesn't exist anymore.

All those places that used to live in dreams are now so altered by reality that we can never get back what was once there: deserted islands with long, unspoiled beaches and warm afternoon rain, turquoise lagoons shaded by coconut palms, fish and wildlife living without fear in Eden—in theory, all gone.

But in the central Pacific Ocean one tiny atoll has somehow slipped through a hole in the side of theory and let the roar of modern history pass by.

Through the quirk of its remote geography, through the sheer determination of the people who have loved it, Palmyra Atoll does exist.




And thanks to its recently completed purchase by one of the world's leading conservation groups, the Nature Conservancy, it should continue as something close to many people's vision of paradise, albeit a very small one.

Counting just what's above high water, the entire atoll is hardly bigger than a single section of midwestern farmland—less than 700 acres of terrain, with no point on it more

than six or seven feet above sea level. For a few hours each day Palmyra aspires to grander proportions; at low tide an enormous plain of calcium carbonate lies exposed—thousands of acres of coral reef flats. The next high water claims them back, and Palmyra shrinks to its true measure.

For decades Palmyra has lingered in quiet isolation as an uninhabited, privately owned

An underwater photograph showing a school of convict surgeonfish swimming over a vibrant coral reef. The fish are characterized by their blue bodies and prominent white vertical stripes. The coral reef below is a mix of green and yellow-green, with some coral having a distinct yellow border. The water is clear and blue, with light filtering through from above.

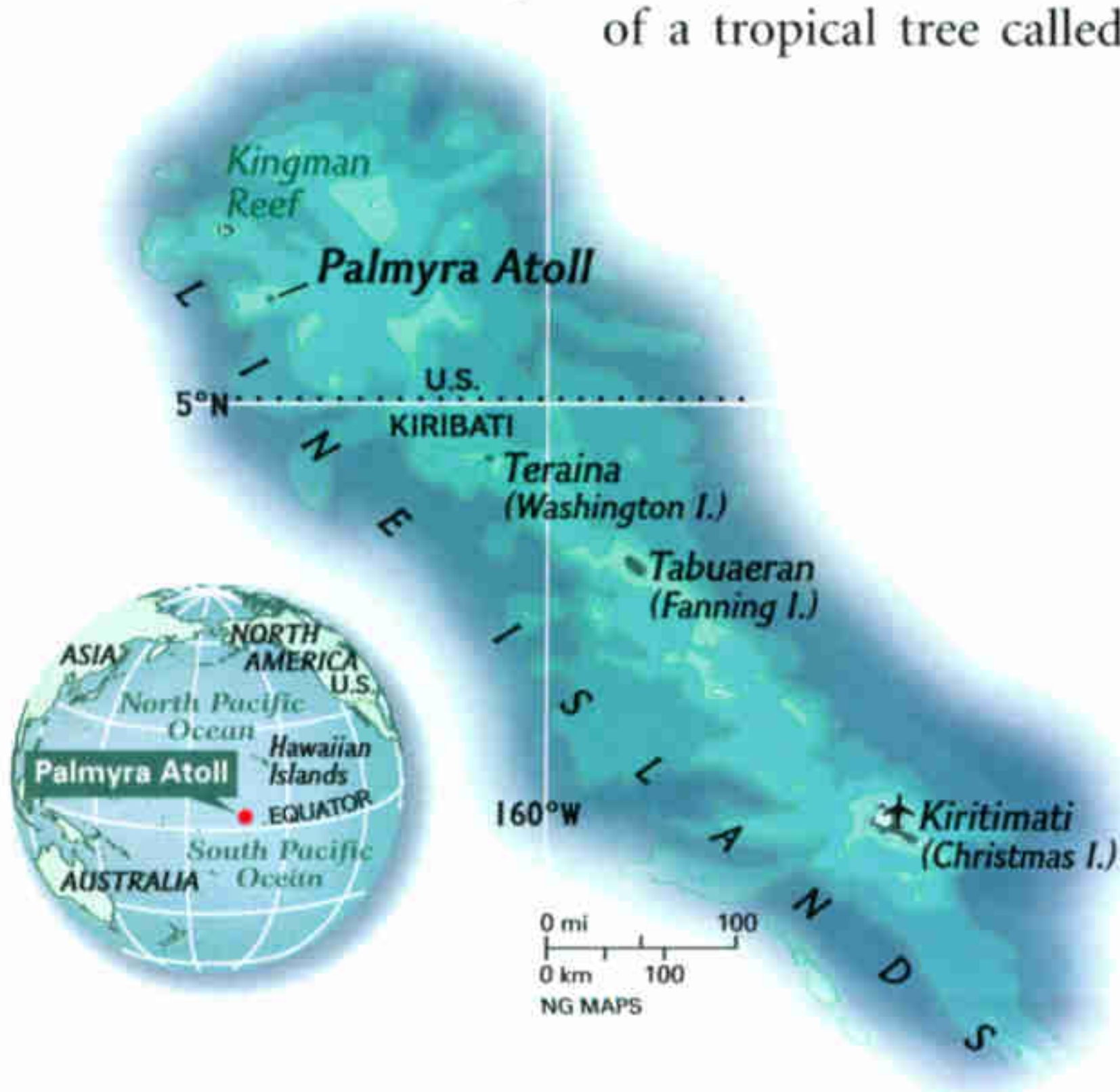
Convict surgeonfish slice through the water above a tossed salad of coral. Some 130 stony coral species grow on Palmyra's 50 scattered islets, remnants of an extinct volcano.

Scars of World War II, a ship channel (right, at upper left) and a rusty gun mount (bottom right) mark this link in the Line Islands chain. Family owned until late last year, Palmyra was eyed as a nuclear dump and as a tourist resort before the Nature Conservancy acquired it for 30 million dollars.

United States territory. There was a moment of notoriety back in the '70s when a fugitive drug dealer sailed here from Hawaii. Worried that his own boat was barely seaworthy, he murdered an island-hopping couple that had stopped at the atoll and stole theirs before he was caught, a story that was turned into a best-selling book, *And the Sea Will Tell*, by Vince Bugliosi, and a TV movie.

Passing yachts or fishing boats aside, Palmyra's main visitors have always been seabirds—some of the largest and most colorful gatherings of them anywhere in the world: red-footed boobies with electric blue beaks, elegant white-tailed tropicbirds, great frigatebirds whose cunning bones, like an old carpenter's pocket rule, can unfold from resting position into wings of imposing length. The atoll has more red-footed boobies than anywhere but the Galápagos Islands. Palmyra is their only breeding site in 450,000 square miles of ocean.

Many of the birds come because of the weather. Palmyra is soggy by human standards, with 175 inches of rain a year. But that rainfall provides for lush, old forests of a tropical tree called



Pisonia, whose fiber is soft like balsa wood. On many islands people have used up all the *Pisonia* for fire or shelter or cleared it away for farming. But Palmyra, despite its small size, has great stands of *Pisonia* up to a hundred feet tall, with buttress trunks and tangled branches. Each spring Palmyra transforms itself into a spectacular forest nursery for tens of thousands of nesting seabirds and their young.

A wildlife biologist with the National Wildlife Refuge System, Elizabeth Flint lists Palmyra among seabird breeding sites of world importance. It's especially important, she says, because there's nothing else remotely similar in the U.S. Pacific islands. In fact, "there probably isn't anything left in all the Pacific like Palmyra, because most of the 'wet' atolls that can sustain



human life have been colonized. And a lot of the organisms in this ecosystem don't coexist with human population."

One afternoon at the eastern end of Palmyra I beached a kayak on the shore of a small barrier island and snorkeled out into the quiet shallows protected by its lee. The water was brilliantly clear, the light shaded only by tidal ripples at the surface. Small patches of coral heads clustered on the sand bottom, then merged to form a reef face and an enchanted garden. Crystalline violet-purple coral grew across the floor like jeweled moss; other corals formed stalks that flattened and spread into broad mushroom heads; still others waved delicate branches, each tip formed like baby ears of corn, each a roasted yellow-brown color,



every kernel a shield for the tiny creature inside.

Jim Maragos, a coral biologist with the U.S. Fish and Wildlife Service, told me that in 30 years of research he's dived thousands of Pacific reefs. "These are the most spectacular that I have ever seen," he said. "There are just magnificent schools of sharks, humphead wrasses, bumphead parrotfish, large groupers—fish that are basically being wiped out elsewhere in the world, especially in the Pacific."

By itself, Palmyra supports at least 130 species of stony coral, several times more than in the Florida Keys. Indeed this single atoll has three times more coral species than all the Hawaiian Islands combined—probably because Palmyra is a thousand miles south of the 50th state, in the warmer waters of the tropics where corals flourish. The atoll is almost dead center in the Pacific Ocean, nearly six degrees or 400 miles north of the Equator, in an expanse of ocean that makes up what's called the intertropical convergence zone. Everything that belongs to the ocean

It's something of a mystery that people never colonized Palmyra. For 20,000 years, since the peak of the last ice age, its coral base has gradually followed the rising sea level and slowly developed into the splendid, living atoll it is today. Many scholars believe that Polynesian navigators would have found this high coral nub, a peak on the Line Islands underwater mountain chain that runs on a northwest-southeast diagonal across the



Crystalline violet-purple coral grew across the floor like jeweled moss.

converges here: flora and fauna, fish and fowl, climates and currents—especially currents.

In the flux of sea forces, Palmyra is positioned like a Balkan border town. Sometimes it's overrun by the sweep of the North Equatorial Current coming from the east. Sometimes the South Equatorial Current shifts north, also pushing past the atoll from the east. More often, though, Palmyra is washed by a narrow water raceway that flows from the west—the Equatorial Countercurrent, which runs in the opposite direction between the two giant, slow-spinning Pacific currents to the north and south. That's why the atoll is such a coral hothouse; it's seeded by larvae carried to it from every direction, and a part of its own rich coral spawn is dispersed to other sites.

tropics of the central Pacific. But for whatever reason—its small size, its remote location—the Polynesians didn't stay.

The first man to note a sighting of Palmyra in a ship's log nearly died from the experience. In 1798 an American sea captain, Edmund Fanning, awoke in his cabin one night on a cross-Pacific voyage. He later wrote that he'd felt a sense of foreboding so strong that he

Multitudes of birds and swarming sea life make this U.S. territory a biological treasure. A masked booby attends a nestling (above). Mullet fry prudently detour around a blacktip reef shark in the shallows just off Home Island (right), where pirate treasure is rumored to be buried.



went on deck and ordered the ship to heave to until dawn. In the morning Fanning discovered a series of dangerous uncharted reefs and a few spits of land dead ahead.

It was several years later that another American ship, the *Palmyra*, made the first official reports of the atoll and fixed its position. Then, sometime after the War of 1812, an American whaler in the central Pacific picked up a dying Spanish seaman floating on a makeshift raft.

He claimed to have been a crewman on the pirate ship *Esperanza*, with a cargo of stolen Inca gold. She'd gone aground on Palmyra, he said, where he and his shipmates managed to salvage the booty and bury it beneath a palm grove. Then they'd pieced rafts from the ship's wreckage and set off in hope of rescue. The Spaniard thought he was the only survivor, and he soon died. What became of the treasure—or whether it ever really existed—is unknown, but the story endured.

Perhaps that's why Hawaii's King Kamehameha IV sent a ship to claim the atoll in

return until the U.S. Supreme Court finally ruled in 1947 that they had title.

Three Fullard-Leo brothers kept that title until a few months ago. The youngest, Ainsley, is 69, a retired air traffic controller from Honolulu who was on the island last May when I visited. His family had gotten all kinds of proposals to buy the atoll, he said. People wanted to turn Palmyra into something



It's something of a mystery that people never colonized Palmyra.

1862, even though it was so far away it took a month to sail there. When Congress annexed the Hawaiian Islands in 1898, it specifically included Palmyra, which eventually wound up as a U.S. territory, almost all of it privately owned by a Honolulu family, the Fullard-Leos.

They almost lost the atoll during World War II—not through any enemy action but rather because the U.S. Navy took over Palmyra during the war. Seabees dredged a channel so ships could enter the protected lagoons and bulldozed coral rubble into a long, unpaved landing strip for refueling transpacific supply planes. By the time the war ended, the military was reluctant to lose its mid-ocean depot. The Fullard-Leos spent years fighting for Palmyra's

useful: a big resort, an offshore bank, a manufacturing outpost to hire cheap labor and avoid American import duties, a commercial fish-processing plant, an equatorial launch site for missiles and satellites. Twenty years ago there was a flurry of excitement—and howls of outrage—when the U.S. government sent a team of inspectors to scout the atoll as a possible site to store nuclear waste. All were rejected, and for the same reason—the Fullard-Leos thought the best use for Palmyra was to leave it as it is.

"I'd hate to see it developed to an extent where it changes the wildlife situation," Ainsley told me. "I think it's a great opportunity to preserve the wildlife in this part of the Pacific."

We were standing near the shore of the eastern lagoons. Blacktip reef shark pups played



in the shallows at our feet, first running at our ankles, then realizing the size of the fearsome creatures attached to them and scooting away. There were giant clams in the sand and a beach nearby where green sea turtles dug nests for their eggs. Seabirds glided low overhead.

In places the reef flats around us showed jagged, rusted stubs where wartime stanchions had ringed the islet behind us with barbed wire. Somewhere in the forest interior an old concrete gun emplacement sagged in defeat. Built to withstand machine-gun and mortar attacks, it is beaten down now by more determined foes: age and weather. Together they are slowly erasing most signs of the human presence that was here during the war.

When I asked Ainsley what he would most want to tell outsiders about the place, he spoke of solitude and peace. “It’s a great place to come and contemplate.”

Now Palmyra should retain its peaceful qualities for generations to come. In November the Nature Conservancy concluded years of negotiations and took title to Palmyra for 30 million dollars. “It’s a marine wilderness—the last of its kind in the Pacific,” says Nancy Mackinnon, who, along with Chuck Cook, coordinated the effort.

Shark-hunting dogs, placed here by the island’s previous owners to help control the local shark populations, will be given new off-island homes by the Nature Conservancy. A coconut sign marks a building erected as a mess hall for a failed copra plantation; it now serves as Conservancy headquarters.

Because no settlers ever colonized it, no one’s survival has ever depended on cutting the forest, or culling the lagoons, or killing off the bird life. That’s why the atoll still has large, healthy, mature fish, forests, and birds you imagine you’d find on any tropical island but that in reality barely survive, if at all, in most other places.

And because Palmyra falls under U.S. law, some of the world’s toughest environmental standards apply here. The Nature Conservancy, and the private donors it relies on, knows that restrictions can be enforced and this atoll truly protected.

The Conservancy plans to keep Palmyra in its natural state, perhaps restoring some parts that were altered by the Navy. Coral and wildlife biologists, botanists, and other researchers will be invited to use the atoll for study, and a small ecotourism operation could allow other visitors to see some of Palmyra’s glories.

Indeed, some already have seen them. Since last spring when it first announced plans to purchase Palmyra, the Conservancy has been flying potential donors out to inspect the atoll and putting them up in an island camp that is both spartan and ecofriendly.

A dozen tent structures sit like mini-Quonset huts on wood platforms. The shelter fabric is a drab beige vinyl, and the sides of the tents roll up to let in a night breeze. The

Conservancy calls it one of the most important conservation projects in the world. The U.S. Department of Interior wants to buy part of the atoll to help manage and protect it. And marine biologist Jim Maragos talks about Palmyra as a kind of biodiversity storehouse, especially for fish and coral. He's thinking about all the other Pacific islands he knows—fished out, and with little chance of recovering on their own.



mosquito netting works perfectly. There is power from two big generators, with efficient mufflers to handle the noise. A desalination processor makes fresh water for drinking, showers, and laundry. Several fire-breathing toilets reduce what you leave in them to a mound of ash. The mess tent features a professional gas range, full refrigeration, and an ice machine.

You can explore very comfortably on Palmyra and in the evening settle back to watch a Technicolor sunset.

MORE ON OUR WEBSITE
Author and radio reporter Alex Chadwick talks about his experiences covering paradise on Earth at nationalgeographic.com/ngm/0103.

As Ainsley Fullard-Leo said, Palmyra is a good place to sit and contemplate—and with a future worth thinking about. The Nature

Balsa-like *Pisonia* trees, logged heavily on other islands, grow unmolested. So does a coconut crab (right), the largest land crustacean. Its sweet flesh makes it a favorite throughout the tropical Pacific. On Palmyra the crab and its fellow creatures will continue to have the run of land and sea.

“I think we need to save places like Palmyra, particularly Palmyra, which has these magnificent fish.” That way, he says, we can try to replenish some of those depleted areas.

Indeed conservationists would tell you this remote atoll's real treasure wasn't buried here by pirates 200 years ago. It's open and apparent for anyone to see—Palmyra holds the seeds of paradise. □



No one knows their origin. No one knows

their fate. Yet a thousand years before the

Inca they created a culture of staggering

wealth along Peru's arid northern coast.

New finds, like this gold-and-copper burial

mask, may help tell the tale of the Moche.

MOCHIE BURIALS UNCOVERED

By CHRISTOPHER B. DONNAN

Photographs by
KENNETH GARRETT

Art by
CHRISTOPHER A. KLEIN
NATIONAL GEOGRAPHIC ARTIST







With sure hands, my colleague Alana Cordy-Collins helps me remove pieces of a gilded copper headdress from one of three Moche tombs dating from A.D. 450 to 550 that we discovered in a mud-brick pyramid at Dos Cabezas, Peru. Five of the skeletons we found, including the child at left, had



bone abnormalities, suggesting they may have been related. The men were significantly taller than most Moche males. Gold and silver ornaments like the one at right, a sign of the Moche elite, were found in the tomb.



Located 40 miles south of the Moche settlement of Sipán, Dos Cabezas was part of the Moche state, which extended for 375 miles along Peru's northern coast. The Moche flourished in one of the driest regions on Earth, devising complex irrigation systems that produced abundant crops.

The large copper bowl lay within my grasp, undisturbed for 1,500 years since it had been placed upside down over the dead man's face. Our team had worked more than a month to reach this point in the excavation of one of the richest and most intriguing tombs ever found in Peru—the tomb of a Moche elite.

The Moche inhabited a series of river valleys along the arid coastal plain of northern Peru from about A.D. 100 to 800. Through farming and fishing, they supported a dense population and highly stratified society that constructed irrigation canals, pyramids, palaces, and temples. Although they had no writing system, the Moche left a vivid artistic record of their activities in beautiful ceramic vessels, elaborately woven textiles, colorful murals, and wondrous objects of gold, silver, and copper.

Finding undisturbed Moche tombs is rare in an area that has been looted for more than four centuries, yet from 1997 to 1999 our team of U.S. and Peruvian researchers discovered three extraordinary tombs at Dos Cabezas, an ancient settlement in the lower Jequetepeque Valley. Outside each burial chamber was a miniature tomb containing a small copper statue meant to represent the tomb's principal occupant. Each tomb also contained a remarkably tall adult male who would have been a giant among his peers.

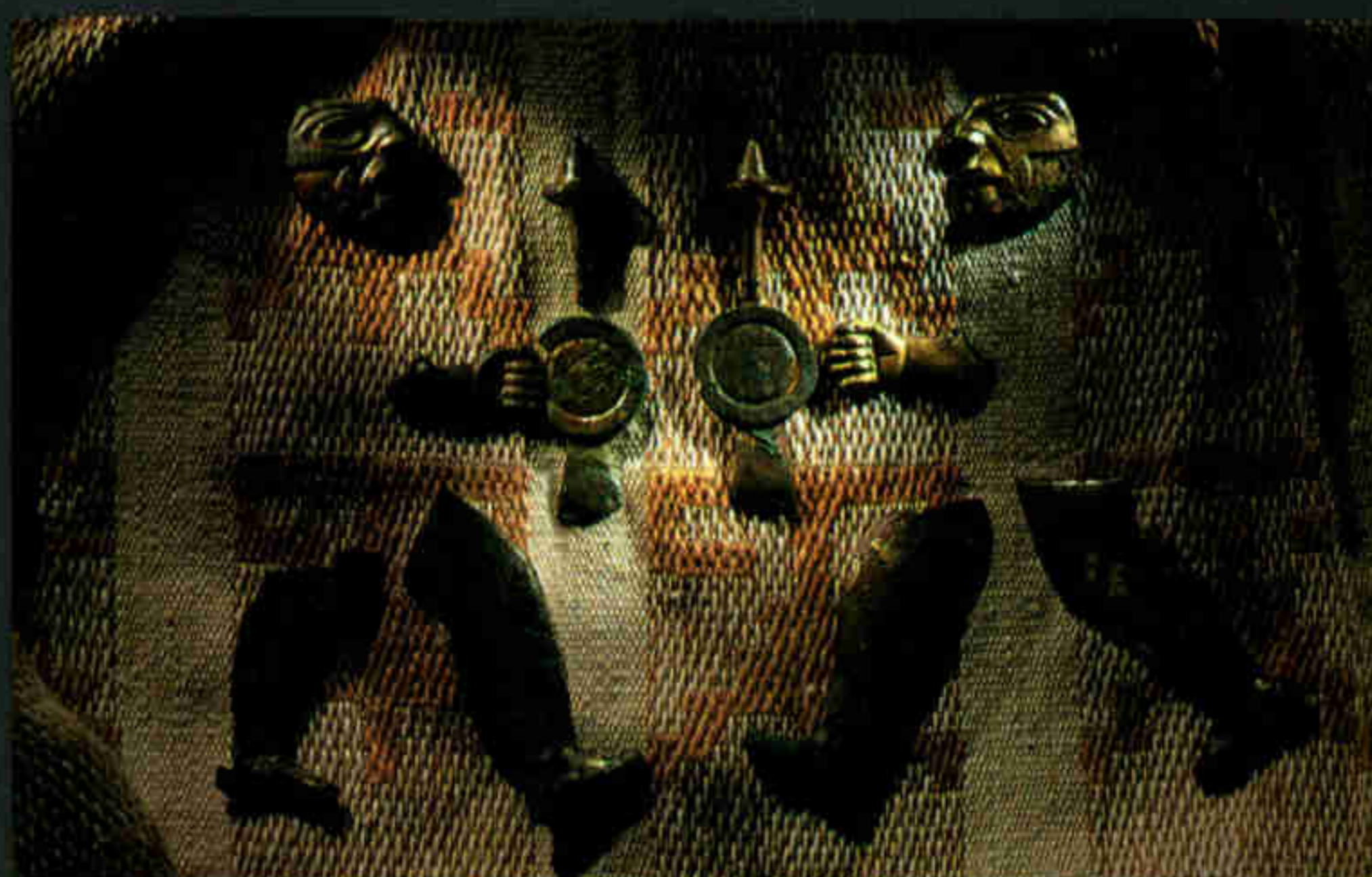
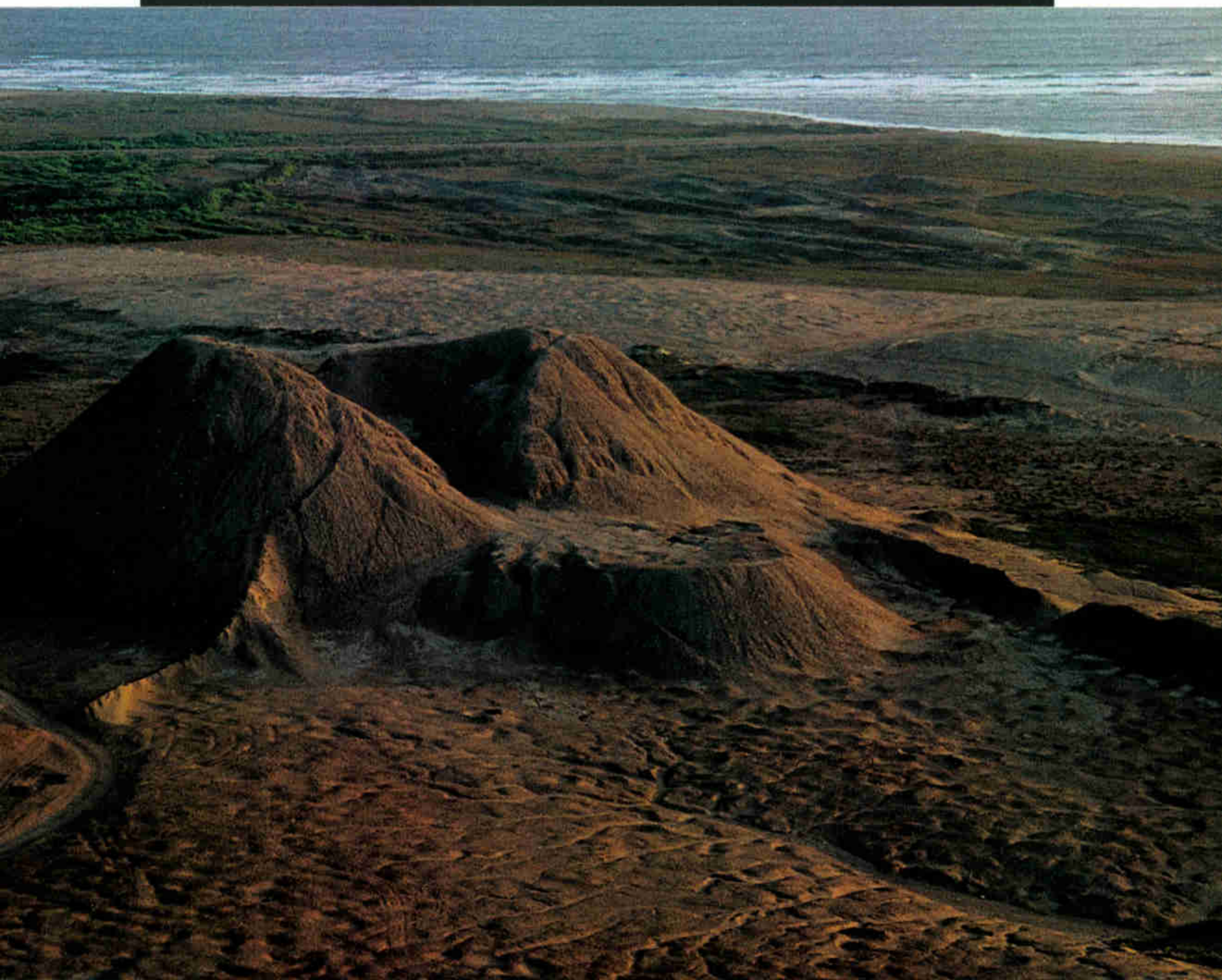
Gently lifting the copper bowl, I expected to see a skeletonized face. But instead, looking up at me with inlaid eyes, was an exquisite gold-and-copper funerary mask. We were all astonished and knew then how important these tombs could be to unraveling the mystery of the Moche.



■ SOCIETY GRANT

This Research Committee project is supported by your Society membership.

Conquistadores cored the 105-foot pyramid at Dos Cabezas in the 16th century in their quest for silver and gold, while modern looters have pockmarked such sites to feed a thriving black market in pre-Columbian art. All missed the tombs on the seaward side, leaving treasures like the gilded warriors below.



TOMB of GIANTS

Moche males ranged between four feet ten inches and five feet six inches in height, says Alana Cordy-Collins, who is studying the skeletal remains. Yet the three men in the tombs towered at five feet nine to six feet. All were 18 to 22 years old, and all probably died within a month of each other. A teenage boy found in



Tomb 2 skeleton



Average Moche male

Tomb 2 was also tall, but a child in Tomb 3 was too young at death to determine sex or adult height. Cordy-Collins suspects the men may have suffered from a disease similar to Marfan syndrome, a genetic disorder that causes thin, elongated bones. Future DNA testing may prove her theory. "It's conceivable that they were all siblings or first cousins," she notes. "Clearly the man in Tomb 2 was the most important."



TOMB 3
1999 Excavation

BURIAL CACHE

Based on their placement in the brick matrix, Tombs 2 and 3 were likely built the same week, with Tomb 1 added a few weeks later. In addition to grave goods, each contained a young woman and the head or body of a llama.

- 1 Miniature tomb containing ceramics, llama head, and copper figurine in textile bundle
- 2 Young female attendant, likely sacrificed, 15 years old
- 3 Male wrapped in layers of textiles
- 4 Child, 9
- 5 Ceramic bottle with lizard motif
- 6 Ceramic bird bottle with offering pots
- 7 Brickmaker's imprint
- 8 Copper figurine in textile bundle buried with mask, head-dresses, shields, war clubs, spears, and spear-throwers
- 9 Ceramic bottles shaped like a condor, sea lion, and cat and a double-chambered bottle in the form of a parrot
- 10 Llama head
- 11 Five offering pots, one of several such groupings
- 12 Llama offering
- 13 Body, mask, head-dresses, and weapons wrapped in textiles to form an elaborate funerary bundle and then encased in clay
- 14 Young male, 15, buried beneath principal figure, possibly related
- 15 Ceramic bottle shaped like a crested animal and offering jars
- 16 Male wrapped in textiles and cane tube

TOMB 1
1997 Excavation

TOMB 2
1998 Excavation

MINIATURE TOMB

Small compartments near the tombs were models of the burial chambers, a feature never before seen.



Peruvian archaeologist Guillermo Cock (in white cap), Alana, and I discuss the excavation of Tomb 3 early in the dig. Colored tape marks Tombs 1 and 2 and their miniature compartments.



Blowing the dust of ages from a funerary bundle, Alana comes face-to-face with the Moche nobleman in Tomb 3. He was buried with numerous offerings: a bird-shaped stirrup-spout bottle, a llama head, and jars in sets of five and ten, suggesting a base-ten number system.

Ornate sculptures of clay, copper, and gold rested in Tomb 2, one of the richest Moche burials yet found. A crested beast—formed as a ceramic bottle (right)—was often depicted by Moche artists in the curve of a crescent moon. The twisted visage of a figure attached to a smudge-fired ceramic bottle (below) reveals the Moche's extraordinary ability



to capture human expressions. A gold owl nose ornament (right), with its bold outline and white-gold beak, displays a mastery of metallurgy and graphic design. It was one of five gold pieces discovered in the tomb occupant's mouth.







Who was the man beneath the mask?

The man in Tomb 2 was buried with an exquisite ceramic bat, a headdress decorated with gilded copper bats (top), and a bat nose ornament of solid gold (far right). Bats were highly symbolic to the Moche, often appearing in depictions of human sacrifice and ritual blood drinking. Did this man participate in these ceremonies? His funerary mask (left and page 59), with its shell eyes and beard-like bangles, is one of the finest yet found in Peru. His grave goods were far more valuable than those of the men buried nearby, suggesting that he wielded enormous power. The items included numerous ceramics, gold and silver nose ornaments, and 18 headdresses—16 of which were made in a style found at no other

Moche site. Was he a high priest who wore a different hat for each ceremony? On the back of his tunic was a cloth human figure with gilded head, hands, and feet, a design seen only on Moche warriors. His funerary bundle contained the finest weaponry of the day—war clubs, spear-throwers, spears, and gold-plated shields. Yet they were likely symbolic, since



none showed damage inflicted by battle, and his fragile bones probably would have failed him in combat. Some Moche lords were buried with gold and silver ingots in their hands, yet he held chisels used for metalworking. Was he a master craftsman? The man beneath the mask remains an enigma.

MORE ON OUR WEBSITE

Find more Moche resources, including a list of works by University of California at Los Angeles anthropologist Christopher Donnan and additional photographs with technical notes, online at nationalgeographic.com/ngm/0103.

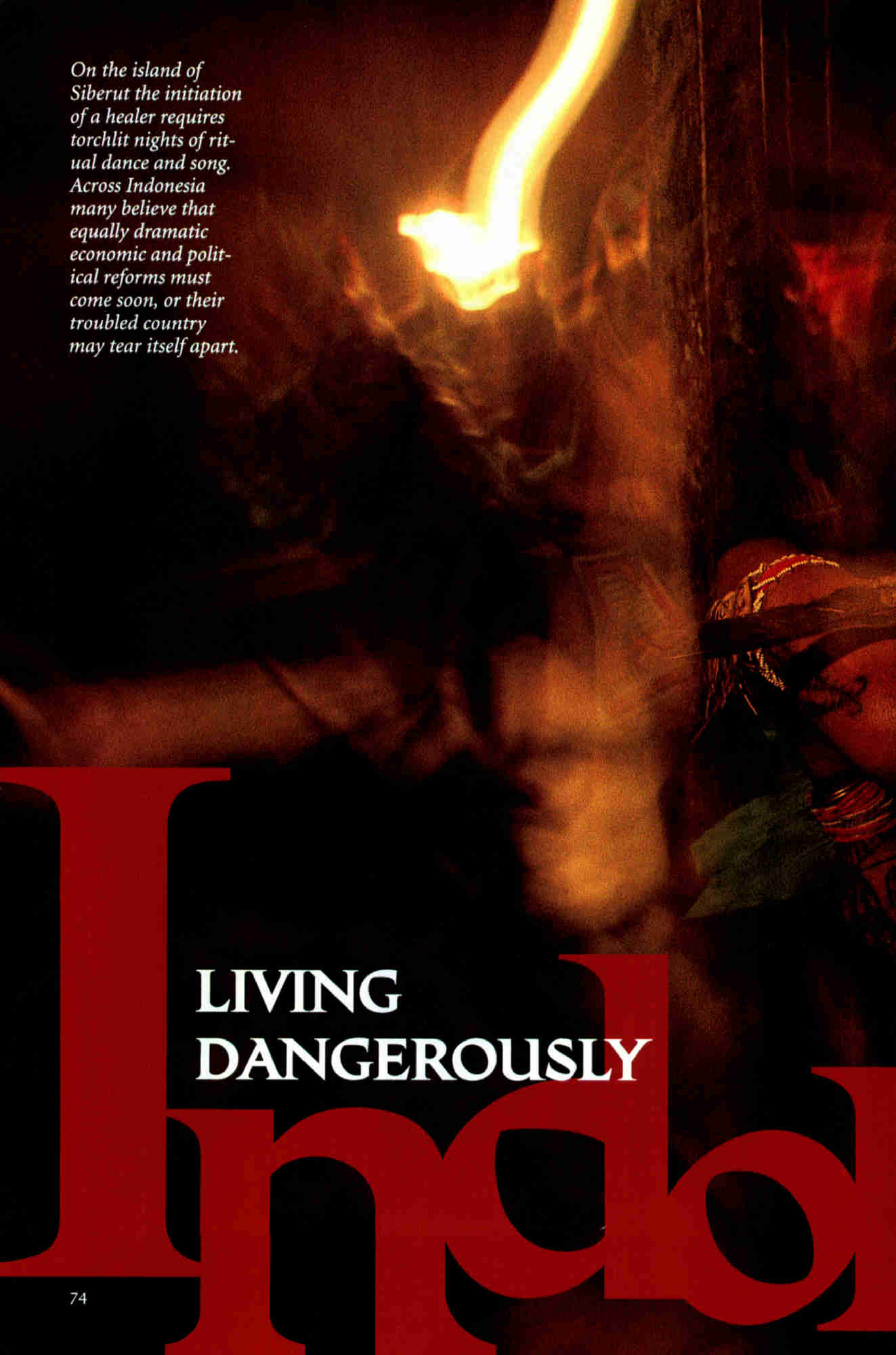


Paired in death, the male in Tomb 3 and the copper figurine in the miniature tomb lie on their backs, heads to the south, amid the remnants of their textile funerary bundles. More than 350 Moche burials have been excavated, but neither I nor my colleagues have seen anything elsewhere



remotely like the ones at this site. The miniature tombs, unusual headdresses, and extreme height of the tombs' principal occupants combine to make Dos Cabezas unique. Each new discovery about Peru's ancient Moche amazes and intrigues us. □



A photograph of a person in traditional Indonesian attire, including a headpiece and beaded necklaces, holding a glowing torch. The scene is dimly lit, with the torch providing the primary light source. The background is dark and textured. At the bottom of the page, the word 'Indonesia' is written in a large, bold, red font, with the 'I' and 'D' being significantly larger than the other letters.

*On the island of
Siberut the initiation
of a healer requires
torchlit nights of rit-
ual dance and song.
Across Indonesia
many believe that
equally dramatic
economic and polit-
ical reforms must
come soon, or their
troubled country
may tear itself apart.*

**LIVING
DANGEROUSLY**



nessia

CULTIVATION *Orderly plots of seaweed checker the shallow ocean bottom off islands east of Bali. The crop can go for 25 cents (U.S.) a pound—significantly more than rice. Seaweed derivatives thicken familiar products from whipping cream to wrinkle cream.*









ISLAM *Shy glances and bold strumming accompany young Muslim students visiting Kebon Raya, a botanical garden in Bogor. Nearly 200 million Indonesians—88 percent—are Muslim, making this the most populous Islamic country in the world.*

Night fell fast over the harbor at

Bitung on the far northeastern tip of Sulawesi, and the refugee camp, an old rattan factory, was hot and steamy as a terrarium. A group of shell-shocked Christians, gathered in the glare of a hanging bulb, were telling how they'd lost their homes on Ternate in the nearby Moluccas.

"The Muslims burned our houses!" said a retired army sergeant. "They destroyed our churches!" the village English teacher chimed in. "We were massacred!"

Such commotion was new to this sweet-smelling hillside town of neat homes and manicured yards but part of a larger malady racing through the watery gut of eastern Indonesia. For decades the area, also called the Spice Islands, had touted its mixed communities of Muslims and Christians as models of interfaith neighborliness. Then, in January 1999, it plunged into primeval war, and now thousands were dead, a half million uprooted, and nobody could say exactly why.

The ex-army man, Anton Letsoin, said that Ternate's troubles began when a letter on faked church stationery was circulated among the island's Muslims. Convinced that a "cadre of Christ" was forming up to attack them, they rallied at the local mosque. There, a witness said he overheard his neighbors raise a chilling cry: "Seek out the *Obets*"—slang for Christians—"and destroy!"

Who had manufactured the letter? The refugees blamed local political schemers, rogue military units, or maybe gangsters from Jakarta, who sought profit by sowing discord. Nobody wanted to believe it was religion. "We were living in peace," cried the teacher. "We never experienced religious hatred before!"

This is the mystery of Indonesia today. Three years after a crashing economy ended the 32-year rule of Indonesia's former president Suharto (who, like many Indonesians, uses one name), the world's fourth most populous

nation boils with such comprehensive religious and ethnic strife that even Indonesians have a hard time explaining it. That's not surprising, considering their anchor-shaped archipelago sweeps 3,200 miles end to end and contains 6,000 inhabited islands and 225 million people, who are, in turn, divided by religion (Muslim, Christian, Hindu, and Buddhist), ethnicity (some 300 groups and as many distinct languages), and water (four-fifths of the country's total area).

It is easy to forget that Indonesians now live in a time of great promise. The collapse of Suharto's corrupt, crony-encrusted regime in 1998 made way for the republic's first democratically elected government in over 40 years and a chance to rebuild its badly corroded political and economic institutions. But the same surge of popular will that shoved Suharto aside also ended the steely controls he used to cap social unrest. Now the lid is off, said a Western diplomat in Jakarta, and "there is extraordinary trauma and a clashing of mental tectonic plates" that could pull the country apart.

That makes Indonesia's neighbors nervous. Many harbor restive elements whose leaders would be further emboldened by Indonesia's breakup. And since nearly half of all maritime shipping on the planet passes through Indonesia's narrow sea channels, trouble there could crimp the flow of oil, liquefied natural gas (LNG), and other commodities that fuel the global economy. "Twelve Indonesias will not be fun for anybody," said Jusuf Wanandi, a senior fellow at Jakarta's *Centre for Strategic and International Studies*.

BY TRACY DAHLBY

PHOTOGRAPHS BY ALEXANDRA BOULAT



Bottling up Indonesia's volcanic intensities has never been easy. The Dutch began creating the basic geographic container 400 years ago when visions of cornering a lucrative market in nutmeg and cloves inspired them to join bits of geology belonging to Australia, Asia, and the Pacific islands into the sprawling Dutch East Indies. Using superior technology (i.e., musket and cannon) and divide-and-conquer tactics, they kept the area's Muslim sultans and tribal chieftains off balance and under control.

After independence in 1949 the republic's founders pressed a national slogan of "Unity in Diversity" but relied on a blend of charm, cunning, and military muscle to keep the country's feral forces in check. And no one ordered the chaos better than Suharto. As a rising army

Drivers in Banda Aceh wait wearily by their motorized trishaws following a riot, part of a long struggle between the army and the Aceh Freedom Movement. "It has been disastrous for the civilian population," says one peace activist.

officer he fought to expel the Dutch from the main island of Java, then in the 1950s crushed popular uprisings elsewhere in the islands. When Indonesia's first authoritarian president, Sukarno, lost control in the mid-1960s—a scalding time remembered by Indonesians as the Year of Living Dangerously—Suharto corked the bottle with a crackdown that cost as many as 500,000 lives.

Suharto went on to translate two oil booms into impressive economic and social gains, fueling aspirations among ordinary Indonesians

The world's fourth most populous nation **boils with religious and ethnic strife.**



for the democratic voice he was determined to deny. “As Suharto became more rigid, authoritarian, and corrupt,” said Sabam Siagian, director of the *Jakarta Post*, “younger generations became more rebellious. . . . They now want a share in political decision-making.” But with no strongman to keep order and only wobbly new democratic institutions to guide them, Indonesians are living dangerously once again. Can they make their unwieldy union work?

For two months I wrestled with that question, exploring Indonesia’s overheated internal geography. Using the traffic-crammed capital of Jakarta as my hub, I rambled through the main island of Java, then pressed on to Kalimantan and Sulawesi. I tramped the bleak lunarscape of the world’s largest copper and gold mine high in the mountains of Irian Jaya

Province on the island of Papua in the far east, traversed a gem green jungle river for a look at the orangutans of Sumatra in the west, and sailed—cautiously—through the redolent, violent Spice Islands in the middle. By journey’s end I was struck by the seeming impossibilities of the country—its strange, wildly diverse beauty and, above all, how ordinary Indonesians tackle its rigors with tenacity, courage, and wry good humor.

Those qualities were at work when I landed in Indonesia’s westernmost Aceh (pronounced AH-chay) Province, where the big island of Sumatra jabs a thumb into the Andaman Sea. In the capital, Banda Aceh, a *bomb had ripped through* the police chief’s home the night before, and



Most of Jakarta's many rivers are so choked with refuse that some residents can make a meager living picking through the garbage (opposite). In Surabaya's brothel district (left) women start working young. A 1992 study by the International Labor Organization found that one in ten of Indonesia's prostitutes is under 17.

the city was deathly quiet, its imposing Baiturrahman Grand Mosque white as a china teacup in the noonday heat. While I started a conversation with Muhammad Ilyas in the doorway of his Harvard English School on Teuku Daud Beureuh Street, Norman Wibowo, my friend and guide, spied two hard-looking men watching us from an unmarked car.

"In this situation," said Ilyas, squinting into the violent sunshine but ignoring the men, "anybody can do anything they want." A wave of bombings had escalated a decades-long struggle between the military and separatists vowing an independent Islamic state. "In class the other night we heard an explosion a hundred meters from here," said Ilyas, a vigorous 35-year-old with bushy black hair and a tense, baked-on smile. "We didn't know what to do!"

Aceh's volatile spirit is rooted in its history as a fiercely independent sultanate, not put under Dutch administration until 1918. Resentment was amplified in recent decades as "Suharto Inc.," the dictator's cabal of associates, skimmed the province's wealth, which includes 40 percent of Indonesia's LNG production, a leading export. Since the late 1980s a stark increase in murder, rape, and other human rights abuses allegedly tied to the military has only deepened the wounds. And it is still too early to tell what success, if any, the new government in Jakarta will have in giving distant Aceh more say over its affairs while not appearing to cave in to its rebels.

That Aceh's four million people are living dangerously was highlighted by the gumshoes lurking outside Ilyas's door. I didn't want to get

my host into hot water, but I had to know: Why had a pious Muslim named his school for a 17th-century Puritan minister from New England? Simple, Ilyas said: While at college in Connecticut he had been inspired by John Harvard's example of "promoting education." Before I left, I gave him a few mementos—a crimson Harvard ball cap that drooped over his brow and a cassette tape with the Mormon Tabernacle Choir singing "Fair Harvard."

Ilyas insisted on playing the tape, but I punched the wrong button and the football fight song "On, Wisconsin" blared out. Nearby storekeepers glared in our direction. Norman rolled his eyeballs at the men in the car.

When we located the Harvard anthem, Ilyas broke into a boyish grin, and we stood at mock attention, warbling the lyrics. But when our cracked notes faded, his smile hardened again. Like many educated, enterprising young Acehnese, he distrusted Jakarta but had grown weary of living in an undeclared war zone.

"I thought we'd make a contribution here," he said. But with uneasy truces leading to more violence, "right now it's hard to concentrate."

Overconcentration of power and wealth in Java is one thing many Indonesians can agree on. Roughly the size of Alabama, the island has two-thirds of the country's population, and Jakarta, its premier city, is the unrivaled center of politics, finance, urban culture, and communications. Resentment of such dominance fuels separatist fires all over the map, including oil-rich Riau Province in east central Sumatra

and remote Irian Jaya, with its gold and copper.

But such rumblings unsettled most people I met. In Bandung, a tree-lined college town 120 miles southeast of Jakarta, where Indonesian nationalists proclaimed the anti-Dutch movement in the 1920s, I spoke with students on "Jeans Street," a discount shopping area known for its looming plaster-of-paris replicas of Batman, Superman, and other action heroes.

"We sympathize with the Acehnese people," said a bluff, handsome young man, a computer science major, "but I worry what will happen if Aceh leaves." Eavesdropping, a truck driver paused his munching on a sticky bun to protest. "What if East Java wants to leave too?" he said, truculently. "I guess it's okay for Indonesia to become a pip-squeak country?"

Averting that fate may hinge on what Indonesians call *reformasi*, or democratic reform. High on the official agenda is cleaning up the country's notoriously corrupt law courts and scandal-tainted banking system.

Other obstacles are less tractable. One rainy night in Jakarta, when thunder rolled and lightning flashed across the heavens, I sat in the parlor of a respected Jakarta journalist who had arranged for me to meet one of Suharto's former spiritual advisers. A garrulous man in dark glasses and a rumpled business suit, the seer told me about the role *kebatinan*, a form of Javanese mysticism and clairvoyance, has played in political decision-making. He confirmed rumors that Suharto had meditated in caves and developed mediumistic powers.

But if Suharto could see into the future, I asked, why was he out of a job? "He didn't listen to me," said the seer with a smile.

"You can't run a modern country like Indonesia by tradition," said His Highness Hamengku Buwono X, the 53-year-old sultan of Yogyakarta, when I caught up with him at a fish farm in the ancient Javanese capital. The sultan, who serves as local governor, was calmly puffing on a cigar, advising rapt villagers on how to use the Internet to be competitive in the global marketplace. A man from one of the country's oldest ruling families (whose name means "he who carries the universe on his lap"), he is considered one of its most progressive leaders.

"If decisions are based on the Javanese way," said the sultan, "people outside Java call it injustice." Furthering Jakarta's tentative efforts

I was struck by the



Safe under an adult arm, a youngster whirls above a carnival in Yogyakarta. Many Indonesian children are not so lucky: Since the economic collapse of 1997 the infant mortality rate has nearly doubled, and more than a third of the country's toddlers suffer from malnutrition.

seeming impossibilities of the country.



to decentralize political power and share the country's wealth more evenly, he said, was the best way to preserve the union. "In the past the central government always thought they knew better. We have to come up with a new approach . . . but there's a long way to go."

Others were convinced that moving forward meant recapturing the past, even if it led to bloodshed. In West Kalimantan Province, on Borneo's western shoulder, Dayak tribesmen had recently battled settlers from Madura, an austere little island east of Java, prompting reports of hundreds of deaths, some "spectacular beheadings," and Dayak magicians invoking warrior spirits to spook the police and army.

So it was with trepidation that I drove through the port of Pontianak, its rivers gleaming darkly in the moonlight, to the deserted edge of town. There I climbed a creaky staircase to meet local Dayak chieftains, who had gathered to make plans for an independent republic. But when the door swung back, I found a light-filled room with a conference table and a cluster of smiling, distinguished-looking men. Dressed in batik shirts and slacks, they glided across the floor to shake my hand.

I asked why they wanted independence. "I used to love Indonesia very much, but everybody wants to separate now!" a young activist blurted out before the chiefs could say a word.

Reddening with frustration, he ticked off local grievances: Big farming and timber

Veiled schoolgirls boat home in Banjarmasin. Indonesian society is "increasingly polarized," says political scientist William Liddle, "between Muslims who define their political interests in religious terms and others who do not."

interests had driven the Dayak, semi-nomadic farmers, from traditional haunts along Borneo's complex river network and into squalid towns. There the Dayak, now mostly Christian, had encountered enterprising, hard-nosed Muslim Madurese, who ran the shops and worked in the factories. The Dayak were chagrined by Madurese custom that allows men to carry the *carok*, a big curved knife, in public—a violation of Dayak *adat*, or customary law.

"They show they are the brave men," said the young man. "They think the Dayak are cowards!"

One of the chiefs lifted a bushy brow and silenced him with a glance that might have paralyzed a small animal, then spoke up softly. The Dayak felt very Indonesian and didn't want to leave the union, he said. "But there is rampant injustice against our community"—in jobs, education, and particularly in sharing the proceeds from the exploitation of Borneo's natural resources. Unless Jakarta offered a solid plan to even the score, the Dayak had no choice but to go their own way.

That sounded reasonable to me, but how to resolve their lethal differences with the Madurese? A chief named Miden said that conflicts had to be adjudicated according to *adat*. If one





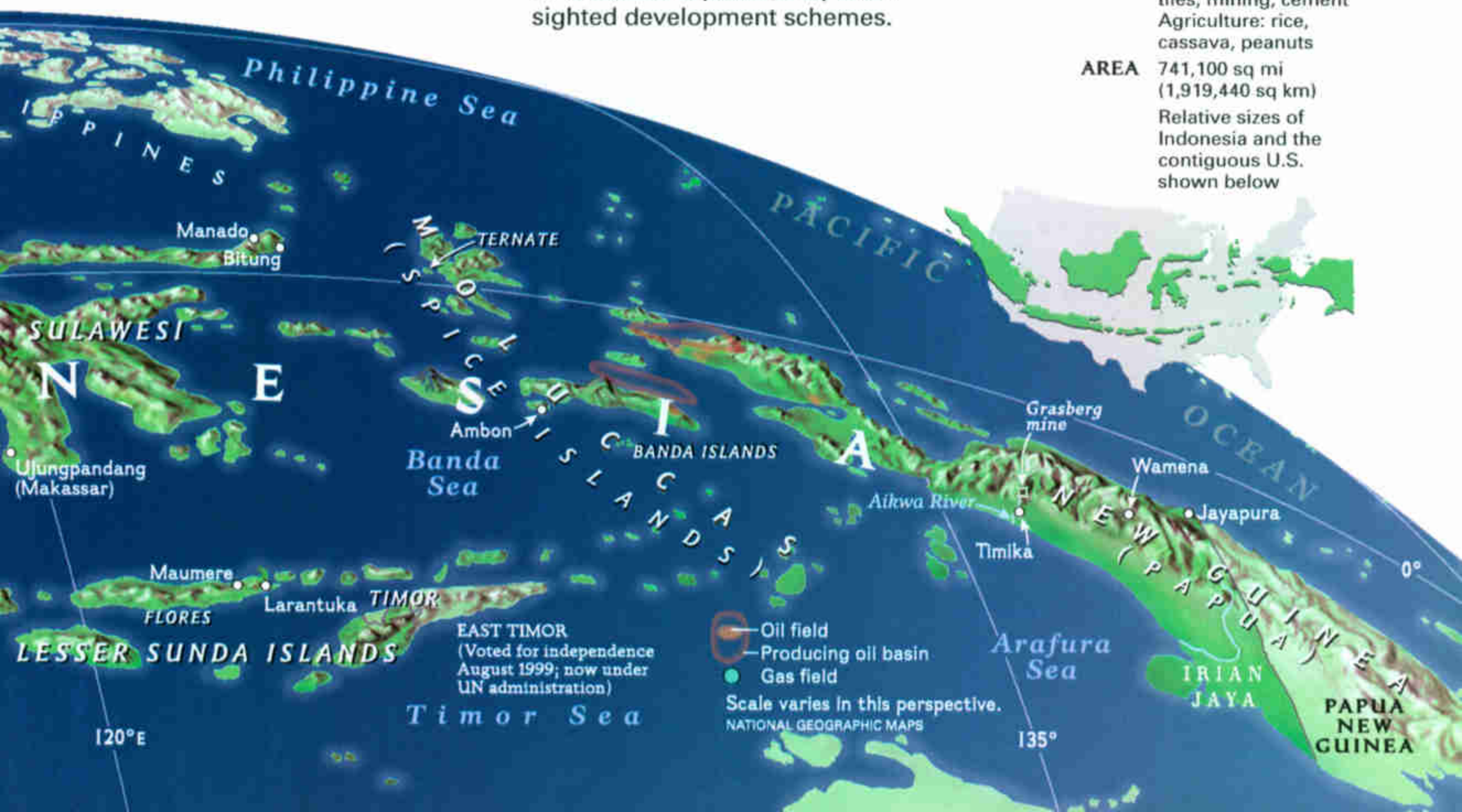
UNSETTLING INDONESIA

CONFLICTS FESTER IN TRANSMIGRATION AREAS

Some 8.5 million people from Indonesia's most densely populated regions were relocated to Sumatra, Kalimantan, the Moluccas, and Irian Jaya between 1969 and 1994. Many observers link recent eruptions of violence on these islands to resentments provoked by the transmigration projects and related voluntary migration. Critics say government-built homes, clinics, and schools

mostly benefit transmigrants, who are mainly Javanese. In some areas newcomers threaten to swamp local populations: Irian Jaya's 1.2 million native Papuans face about a million migrants. The World Bank has concluded that its half billion dollars in transmigration loans produced "irreversible impacts" on indigenous peoples—including seizure of land and destruction of traditional subsistence patterns by short-sighted development schemes.

POPULATION	224,784,000
CAPITAL	Jakarta
RELIGION	Muslim (88%), Christian (8%), Hindu (2%), Buddhist (1%), Other (1%)
LANGUAGE	Bahasa Indonesia, English, Dutch, Javanese and others
LITERACY	84%
LIFE EXPECTANCY	68 years
GDP PER CAPITA	\$2,800
ECONOMY	Industry: petroleum and natural gas, tex- tiles, mining, cement Agriculture: rice, cassava, peanuts
AREA	741,100 sq mi (1,919,440 sq km) Relative sizes of Indonesia and the contiguous U.S. shown below



LABOR *Lacking the simplest protective gear, miners struggle through toxic fumes to carry hundred-plus-pound loads of sulfur out of an active volcano in Java. Greedy for economic growth, the now defunct 32-year Suharto regime paid scant attention to worker safety.*





“Hello, Mister!” he said—the universal greeting for foreigners. **“I’m a victim of foreign corporate reorganization!”**



Madurese harms another, try them by Indonesian law—but if a Dayak is victimized, tribal elders must decide.

Many Indonesians I talked with felt the country’s haphazard justice system gave ordinary people little recourse in the law. Yet to allow rival ethnic groups to judge one another by conflicting, homegrown rules struck me as a recipe for endless disaster.

“We don’t have to kill the Madurese,” said Miden, drawing on a cigarette. “We’re civilized people.”

That seemed clear the next day when I drove north over the Equator and into Dayak country. The highway shot through sunny patches of jungle along a river where small fat pigs ran for cover and women in sarongs dried streaming hair. Yet this was the same area where

Dayak had reportedly retaliated for earlier attacks on their tribesmen by pulling Madurese from their cars—at times relieving the dead of their heads and eating their livers.

A local journalist broadly confirmed the mayhem—four Madurese had died for every Dayak. A Dayak herself, she was convinced the Madurese had started it. “They don’t like the Dayak people,” she said. I wanted to ask the Madurese about that but many had fled, and the rest proved hard to find.

At 198 million, Indonesia has the largest population of Muslims in the world, making it inevitable that its road to the future run through the country’s Islamic identity. I began to appreciate what such numbers mean when I visited



Oil fields like Kalimantan's Muara Badak works (left) produce Indonesia's most valuable exports. In Irian Jaya what even mine operators call an "obviously lifeless" deposit of mine waste (opposite, in background) piles up along the Aikwa River at 194,000 tons a day. By the time mining ends, some 90 square miles will be in need of reclamation.

Kediri, a dusty crossroads city in East Java's volcano-ringed farming belt, and watched tens of thousands of the faithful stream into a narrow, maze-like lane to attend the annual convention of Nahdlatul Ulama, Indonesia's biggest Muslim organization.

A leaden sky was spitting rain the temperature of bath water when I squeezed into the slow-moving throng. Never much for crowds, I had decided to call it quits when a muscular young man in wraparound sunglasses appeared at my right elbow.

"Hello, Mister!" he said—the universal greeting for foreigners. His name was Yudha. "I'm a victim of foreign corporate reorganization!" he said, adding that unrest in nearby Surabaya, Java's industrial second city, had prompted his European employer to pull out.

Numerous Indonesians facing hard times had found their anchor in Islam. "Something to hang on to," said a Muslim friend in Jakarta, "and a backlash against Western influence," which was washing through the culture and widely blamed for encouraging antisocial behavior.

Like many Muslims I met, Yudha was a thoughtful, generous person, and with him in the lead, we reached "convention central" in no time, a big white tent in a soggy field, where Abdurrahman Wahid, the country's first democratically selected president and a former Nahdlatul Ulama chairman, was speaking.

Waves of polite laughter rippled through the crowd, and Wahid's constituents seemed delighted with his promises to bind the

country together with renewed respect for cultural diversity and human rights. Yet many Indonesians saw his inability to stem terrorism as encouraging the forces of disintegration.

When I spoke with Gus Maksum Djauhari, who heads a local Islamic boarding school, he assured me there was no cause for alarm. "God willing, we can now have unity in diversity," he said, limning Indonesia's founding motto, "with a big sense of national pride." With Wahid at the helm, he said, government could finally rally the teachings of Islam as "a potent force for character building."

But the mingling of mosque and state worries many moderate Muslims, who, though still probably in the majority (reliable numbers are hard to come by), are wary of the inroads of Islamic fundamentalism. Wardah Hafidz, a leading advocate for the urban poor, told me that a growing number of female office workers had adopted the *jilbab*, or Islamic head scarf, which she saw as a symbol of how women in particular were caught in the middle. "They want to act in society," she said, "but are made to feel they're not good Muslims if they do."

The line between Islam as a fashion statement and as a deeply held belief can be a blurry one, but according to Mochtar Buchori, a member of the Dewan Perwakilan Rakyat, Indonesia's parliament, the fundamentalist drift raises a question that few people are willing to talk about openly. "What kind of Islam are we going to have as the mainstream?" said Buchori. "If we're heading for a hard-line Islamic civilization, this country is really going to disintegrate."

Orangutans formerly kept as pets (right) will be slowly helped to master life in the wild by Kalimantan's Wanariset Orangutan Reintroduction Project. A transmigration settlement in Irian Jaya (opposite) relies on logging, one of the main threats, along with palm oil plantations and forest fires, to the orangutans' remaining habitat.



I got a glimpse of what such chaos might be like in the old trading port of Makassar at the southwestern tip of Sulawesi the night I boarded a passenger ship called the *Bukit Siguntang*, bound for the remote Banda Islands. Under floodlights police armed with automatic weapons prodded travelers up the packed gangway or pulled them aside to search their luggage for guns or knives. Security was tight because the ship would first stop in Ambon, the city in the southern Moluccas where the worst of the fighting between Christians and Muslims had taken place.

Not thrilled about traveling such treacherous waters, I was nonetheless determined to see the Bandas because of their central role in shaping early Indonesia. In the 17th century this tiny subset of the Spice Islands was the center of European efforts to monopolize the trade in nutmeg, prized in pre-refrigeration Europe for preserving meats and wrongly thought to ward off plague. Most intriguing was an obscure 1667 treaty that capped off a "spice war" with a novel arrangement: England would swap its piece of the Bandas for an isolated Dutch trading post, the island where I live—Manhattan.

So to prove to myself that even in middle age curiosity can trump raw fear (and because airports were closed), I elbowed my way on board. There I made an unsettling discovery: My friend Norman Wibowo and I would be sharing the ride with 600 members of a militant Islamic group called the Laskar Jihad. Reports I had seen in which the Jihad allegedly had vowed to defend Muslims in Ambon by

cleansing the area of Christians flickered through my mind. Since all *bule*—white people—were automatically "Christian" hereabouts, and Norman was in fact one, I was now truly worried.

The dim companionway was clogged with the Jihad, young men with prayer caps and scraggly chin whiskers, looking hollow-eyed and severe.

Locked in my tiny cabin, I entertained unmanly thoughts of jumping ship. But in the morning light, as I picked my way along the corridor, the Jihad looked like kids away from home for the first time, awkward, a little malnourished, and slightly less dangerous than teenagers waiting in line for a rock concert.

From the bridge the Banda Sea, broad and inky blue, combed along in luminous sunshine, but a dispute was brewing on board. Chief Officer Andre Pontoh said Jihad leaders had accused him of a grave error—posting the wrong times for the five daily prayers when devout Muslims are required to bend toward Mecca. They were wrong—the veteran seaman had carefully calculated the schedule according to the ship's position. That didn't matter. On a recent trip a minor dispute had sparked a shipboard riot, and angry young men had lined up at the bridge windows to jeer at Christian crew members and run fingers across their throats.

"That man saved us!" said Pontoh, nodding at an avuncular gentleman in a baseball cap whose name was Abdurrachman Khoe. A frequent passenger and a Muslim leader in Ambon, Khoe had used the ship's public address system to calm the rioters.

The mingling of mosque and state worries moderate Muslims, who are wary of Islamic fundamentalism.



What do the Laskar Jihad intend to do in Ambon? I asked him. Although physical attacks on Muslim villages and mosque-goers in the Christian-dominated city had escalated, Khoe assured me they were bent not on vengeance but on a purely social mission to aid downtrodden Muslims.

That last point was debatable, but it was true that the Moluccas were now so tense that *habis*, slang for annihilation, awaited Muslims caught in Christian strongholds and vice versa. The flood of refugees fleeing the turmoil had further complicated travel in a country that is largely water. All the ships were overcrowded and worked to the point of breakdown, but, said Pontoh, “If we don’t sell tickets, people burn our ticket offices down!”

Yet I marveled at how most of the ship’s

passengers went quietly about their routines, taking the risks in stride. That afternoon Pontoh and I visited the cabin of a pearl trader, a snaggletoothed man in a checkered sarong who presided over a box of plastic baggies bulging with pearls from the Arafura Sea.

“*Bagus*—Excellent,” he said, holding aloft a lustrous black pearl the size of a pea. As a boy I’d read tales of wild, seagoing corsairs and smugglers of tropical islands, and for a moment I was caught up in the romance—until the door opened. In shot a pair of heads, two rough-looking characters who surveyed the scene with sharklike smiles. The trader slammed the door in their faces and locked it.

“So I don’t get murdered,” he said.



MONUMENTS Sacred to the Tenggerese of eastern Java, Mount Bromo, surrounded by a sea of sand, is part of a national park. To protect its national treasures Indonesia relies on funds from foreign governments and international conservation organizations.



Local clashes over land were old when



Europeans arrived.



Sweet potatoes from her garden and a two-pig escort promise abundance for a Yali woman in her Irian Jaya village. But even in these isolated highlands the struggle for autonomy casts a long shadow. Last October separatist violence in nearby Wamena killed 30 people.

The next day at noon we sailed into Bandanaira, the Bandas' main harbor, gliding under the towering green cone of its sentinel volcano. I was relieved to finally be there but disheartened that the rage sweeping other parts of Indonesia had found this remote spot too, as Tanya Alwi, an environmental activist, was quick to point out. Tanya, whose family ran the local hotel, said an argument between a village headman, a Christian, and a teenager, a Muslim, had unspooled, and 28 Christian homes went up in flame in a single night. A charcoal shell was all that remained of the town's Catholic church. Other structures had been reduced to thick stone walls of Dutch construction.

"One thug said to me, 'Be grateful we purified your island,'" said Tanya, with a mirthless giggle. A Muslim *hajja*, who had made several pilgrimages to Mecca, Tanya abhorred the violence. And it hadn't been good for business: I was the first guest to stay at her Dutch colonial-style hotel in two years.

That evening Tanya and I sat on the battlements of Benteng Belgica, a Dutch fort built in the high days of the nutmeg trade, as the orange-white sunset blazed around us. "I'll swap you a building lot over there," she said, pointing toward the glimmering volcano, "for your apartment in Manhattan!" I appreciated her effort to lighten the mood by recapitulating local history, but I declined. The Bandas were absolutely gorgeous but too rough a neighborhood for your average New Yorker.

And too sad. Nutmeg still flourished here, but, now a simple condiment, it no longer captured the world's imagination or its pocket-book. Surprisingly, the population of the Bandas was roughly the same as in Dutch times—about 15,000—but the rage had stirred it around. Most Bandanese Christians had been evacuated to camps near Ambon to be replaced on the islands by Muslim refugees from the beleaguered city.

"It's blind hate now," said Ramon Alwi, Tanya's brother, as we sat near a banyan tree at the hotel drinking good, dark coffee from the Indonesian hills. For both Muslims and Christians the disputes had taken on fatalistic overtones, said Ramon, "but basically it's more cultural than religious."

The Spice Islands harbored countless local clashes over land boundaries or scarce



RITUAL *Two men wait in their car as a procession carrying offerings of fruits and flowers to a nearby temple stops traffic in Denpasar, Bali. Nearly all Balinese are Hindu, though only about 2 percent of Indonesians nationwide share that religious tradition.*





“How do soldiers feel when they torture and kill their own people?” asked an unseen participant.



Bitter over decades of exploitation by Jakarta, Irian Jaya's mostly Christian native peoples gathered last spring in Jayapura (opposite and left) for the Second Papuan Congress. Declaring Indonesia's claims to their land illegitimate, they vowed a continuing struggle for freedom.

resources that were old when spice-seeking Europeans arrived to amplify the tensions. In the Bandas the Dutch won local princes over to Christianity by giving them cannon to fuel bloody sibling rivalries. “Those fights are still remembered in the villages” and are easy to rekindle, Ramon said.

Who had provided the spark this time? Many suspected that forces loyal to Suharto wanted to touch off a chain reaction of violence in the islands that would destabilize the government in Jakarta. “There had to be an emcee,” said Ramon, but basically it was the old, complicated story of Indonesia: too many fighting for too little.

In the corner of the patio a giant TV screen flickered with images of a scantily clad rock diva gyrating on MTV. “People in Jakarta talk about ‘globalization,’” said Ramon, and how the new consumer culture would pull Indonesians together by sandpapering the rough edges off parochial customs, “but here,” he added wryly, “we’re two centuries away.”

In truth, it is too early to tell whether the river of new data is pulling the country together or forcing it apart. Yet what Indonesians call *informasi*, or their end of the worldwide information revolution, may enhance an old vision of the republic’s founders. In 1945 the embryonic republic officially

established a Malay language, Bahasa Indonesia, as the nation’s official tongue, thus giving its polyglot citizens a common means to air their differences. Today, after the harsh controls of the Suharto years, Indonesians are using it to communicate in a free, flourishing, if rambunctious vernacular press. In the bigger cities Internet use, though still small, is estimated to be doubling every 12 months.

To see how *informasi* was unrolling, I drove across Jakarta in a soupy rain to call on Desi Anwar, who had been named executive producer of Astaga!com, an online news service. Desi had persuaded the tight-lipped military, in the burly form of Air Vice Marshal Graitto Usodo, to take part in an online chat session, and Graitto had his work cut out for him.

Over the months, the unfettered media had helped unearth a string of gruesome human rights abuses in places like Aceh and Irian Jaya, many of them allegedly involving the military, or TNI. Now the media was leading a nationwide debate about how to limit TNI’s role in national politics. The outlines of that argument were etched, acidly, in questions from online interrogators appearing on a big wall screen in Astaga!com’s conference room.

“How do soldiers feel when they torture and kill their own people?” asked an unseen participant calling himself Sliderman.

Graitto: “Feeling is not at play. . . . There has been negative excess in the line of duty . . . but don’t just read the headlines.” Another questioner, Funkyadoo, asked if Graitto liked pets. “Yes, I have a dog named Buster,” he said.

“Would Buster be a rottweiler or a German shepherd?” Funkyadoo asked with blunt irony.

“Which one is more ferocious?” Graitto shot back, with a grin.

"This is fun," said Graitto, but when I asked him later what he made of the edgy questions, he politely demurred and started chewing a pastry from a catering tray.

Desi, whose work as a television reporter helped force Suharto from office in May 1998, said the cross talk, however clumsy, cynical, or politically tilted, was part of a badly needed catharsis. Everything had to be sorted out and dealt with. "We've seen the dark side of Indonesia," she said. "Now it's important to put the demons behind us."

On my last day in Indonesia, I sat on the top floor of one of Jakarta's high-rise hotels, watching the city's dizzying, thistle-like skyscrapers push up through the sunbaked smog. Having glimpsed some of its darker corners, however briefly, I wondered whether the country's centrifugal urges could ever be peaceably—or democratically—contained.

"If we're holding together after five years," said my friend Sabam Siagian, who had joined me in a cup of tea, "that's the miracle!" A spirited man in a crisp batik shirt, Sabam, a veteran journalist and a former ambassador to Australia, had a tart, incisive way of speaking, and I enjoyed his blunt honesty. Indonesia would have to make big changes in politics, the economy, law, education—whatever was required to create a new culture, based on respect for human rights regardless of ethnicity, culture, or religion. In short, he suggested, Indonesians would stick together because they wanted to, not, as in Suharto days, because they had to.

As we sat in the photochemical gloaming, I wondered whether they could do it. "There will be hot spots here and there," said Sabam, with the confidence of a man who knows dealing with the future occasionally requires climbing out on a limb. Indonesia might even lose a renegade part or two. "But the country will hold together and muddle through."

That was an appealing article of faith,

and for this strange, beautiful, and scattered country and its people the hope for a scattered, if peaceable future struck me as a reasonable prayer. □

MORE ON OUR WEBSITE

Check Sights & Sounds for a multimedia show of Alexandra Boulat's photos, and discuss the causes of violence in Indonesia at nationalgeographic.com/ngm/0103.

"If we're... together



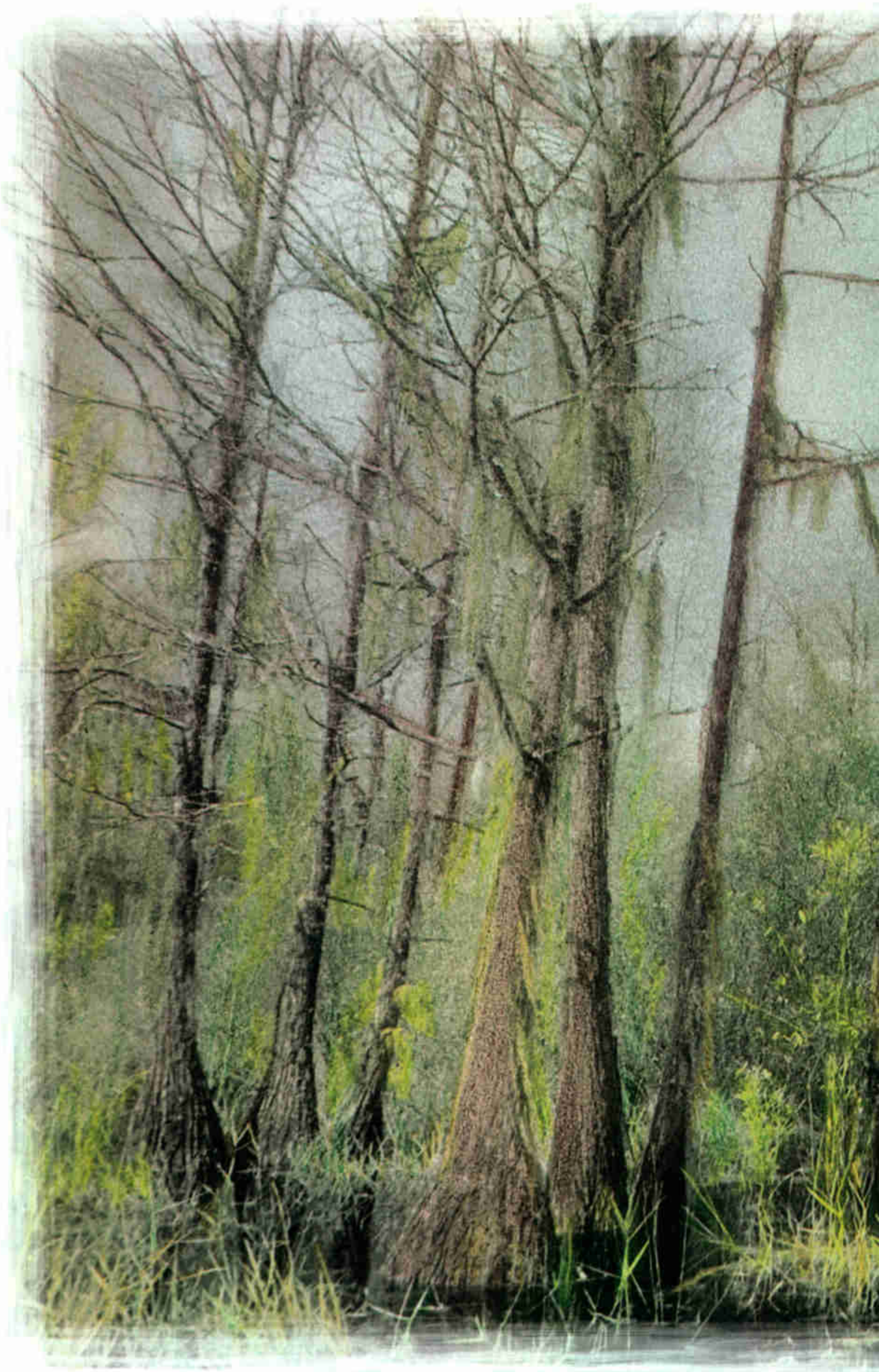
A stained and wrinkled image of paradise fills the wall behind a solitary diner in Larantuka, a port on Flores. Similarly tattered, Indonesia's union may yet survive—if its diverse peoples find equitable ways to share the burdens and opportunities of rebuilding their society.

after five years, that's the miracle!"



Soundless as a black-water river, a paddler in Georgia follows in the wake of William Bartram, one of the first naturalists to explore the wilds of the American South. As settlers strove to subdue the wilderness, Bartram celebrated it, helping change forever the way we see untamed nature.

PHOTOGRAPHS HAND TINTED BY JILL ENFIELD; CALLIGRAPHY BY JULIAN WATERS



A Naturalist's
WILLIAM

By GLENN OELAND NATIONAL GEOGRAPHIC SENIOR STAFF



Vision of Frontier America
BARTRAM

Photographs by ANNIE GRIFFITHS BELT



WITHIN THE MARBLE WALLS of a portrait gallery in the heart of Philadelphia, just down Chestnut Street from Independence Hall and the Liberty Bell, hang the likenesses of early America's political and intellectual elite. Many signers of the Declaration of Independence are there, as are the soldiers and statesmen who by their valor and wisdom won distinction during the birth hours of the United States. Some, like George Washington and John Paul Jones, are widely famous; others, such as Timothy Matlack, the calligrapher whose elegant handwriting likely adorns the Declaration, are nearly forgotten.

The gallery was graveyard quiet the morning I stopped by to pay homage to one of its illustrious obscure, a native Philadelphian named William Bartram. I was surprised to find him front and center, in a forward gallery reserved for esteemed scientists, explorers, and artists. Hung by itself at the very focal point of the room, the oil painting of Bartram by the inimitable Charles Willson Peale upstaged all the others, including that of Stephen Long, the pathfinder whose name is attached to a skyscraping peak in the Rocky Mountains. Bartram even eclipsed Lewis and Clark, who seemed to stare out at him from their corner with a twinge of envy.

Karie Diethorn, the gallery's curator, explained why this shy Quaker botanist received such star billing.

"He was a local boy who made good," she said. He was also among the first of the great traveling naturalists, predating Lewis and Clark by a generation and John James Audubon by two. Going by horseback, by canoe, and on foot, Bartram botanized his way across the whole of the southern wilderness—from the barrier islands of Georgia westward to the bayous of the Mississippi River and from the savannas of Seminole Florida northward to the mountain homeland of the Cherokee.

After nearly four years of rattling around the backwoods of British America, Bartram emerged with his saddlebags full of plants heretofore known only to Indians and his sketchbooks bulging with vivid depictions of exotic animals. And set down in his journals were discoveries and adventures enough to fill a book.

Bartram eventually got around to writing that book, and today his *Travels* is considered a classic in the literature of exploration. Though written in antique prose and peppered with Latin plant names, the book remains a favorite with nature-loving, history-conscious people.



*B*orn in 1739 in this house in Philadelphia, Bartram and American natural science came of age together. A late bloomer, he was 34 when he set out on a pioneering botanical survey of the South.



Four years later he returned home to paint his discoveries, like this evening primrose (left), and write his epic “Travels.” By his late sixties (portrait) he was esteemed the grand old man of nature study in America.

For them *Travels* is a guidebook to a lost landscape, a transporting and often elegiac portrait of a barely touched America.

In the current of American thought Bartram stands as one of the great point men of wilderness preservation, a planter of philosophical seeds that would germinate generations later. Says Thomas Slaughter, the author of a recent book on Bartram, "I could call him an 18th-century Thoreau, but it makes more sense to see Thoreau as a 19th-century Bartram."

Like Thoreau, Bartram explored nature with his emotions as well as his senses. He was awestruck by gargantuan trees, terrified by battling alligators, and grieved by a pitiful bear cub whose mother had been killed by a hunter: The orphan bear, Bartram recorded, "approached the dead body, smelled and pawed it, and appearing in agony fell to weeping and looking upwards, then towards us, and cried out like a child." Such sensitivity to the suffering of animals was rare in frontier America, as was concern for the welfare of Indians—a cause Bartram took up long before it became fashionable. What made him different?

"Bartram had the head of an Enlightenment scientist and the heart of a Romantic poet," Slaughter said as we talked in his book-lined office at Rutgers University, where he teaches American history. "He was also a devout Quaker who saw all people as equals in the eyes of God and every living thing as part of a divinely ordained whole."

To Bartram's alert, reverent eye, each blossom and bee was a work of divinity, and nothing made him so happy as "tracing and admiring the infinite power, majesty, and perfection of the great Almighty Creator." But exploring the wilds of early America was no Sunday school picnic for this prayerful botanist. Bugs bedeviled him, lightning knocked him senseless, wasting fevers laid him up for weeks. At times he grew despondent, even despairing. What kept him going? As he explained it, he was "continually impelled by a restless spirit of curiosity."

That burning itch to know what new bloom or virgin vista lay around the next bend was an inherited trait. His father and mentor, John Bartram, trekked thousands of miles over a lifetime of plant collecting. He also cultivated one of the country's first botanical gardens and gained international respect in his day as an authority on American flora.

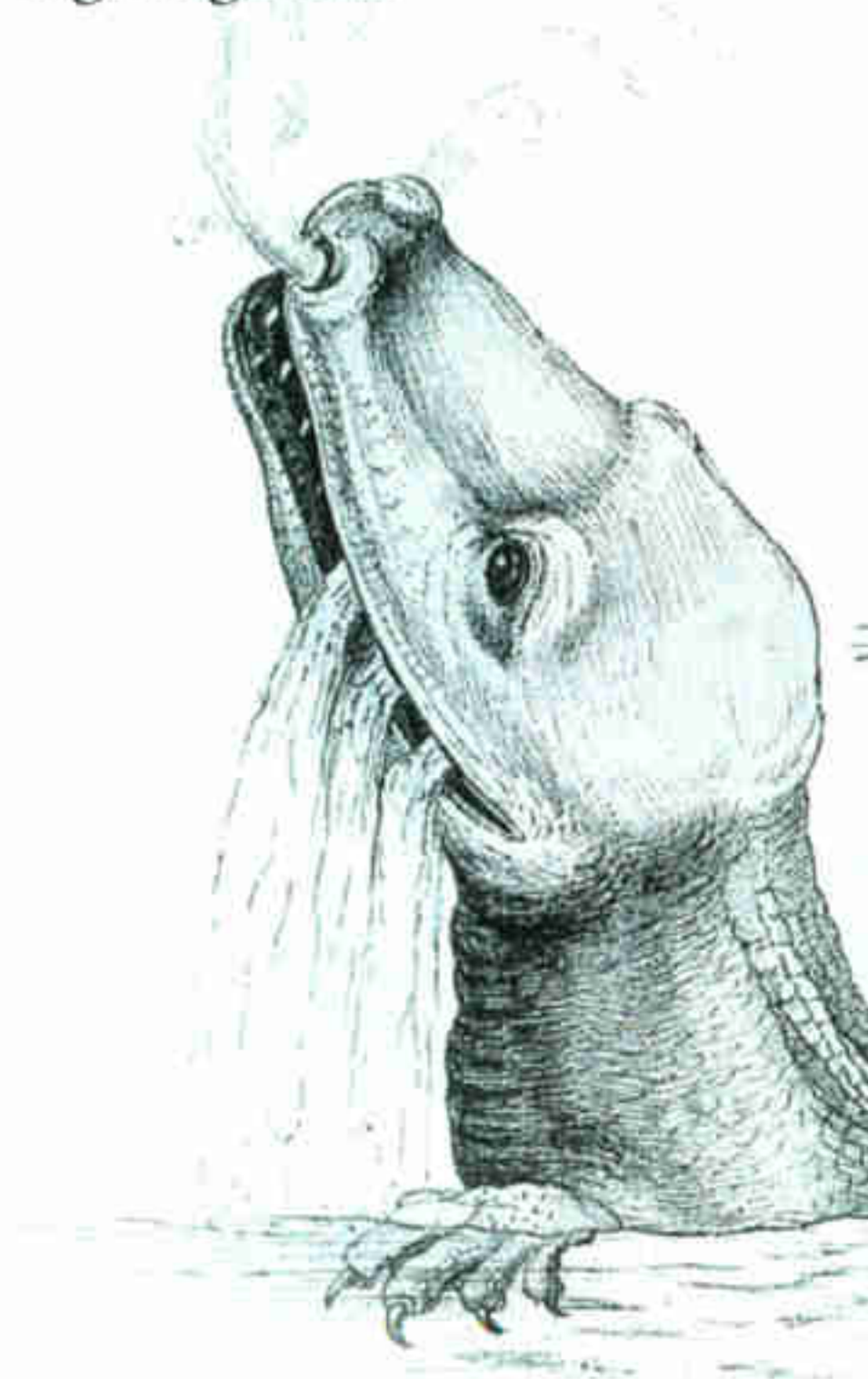
TO GET AT THE ROOTS of the botanical Bartrams, I journeyed to their family seat on a Pennsylvania hillside overlooking the Schuylkill River. What may be most remarkable about Historic Bartram's Garden, as the place is called now, is that it survives. Marooned amid the sprawl of southwest Philadelphia, this 46-acre public park is surrounded by industrial blight and skewered by two freight rail lines. Inside the old farmstead, however, the area's hard gray edge softens to a tender green.

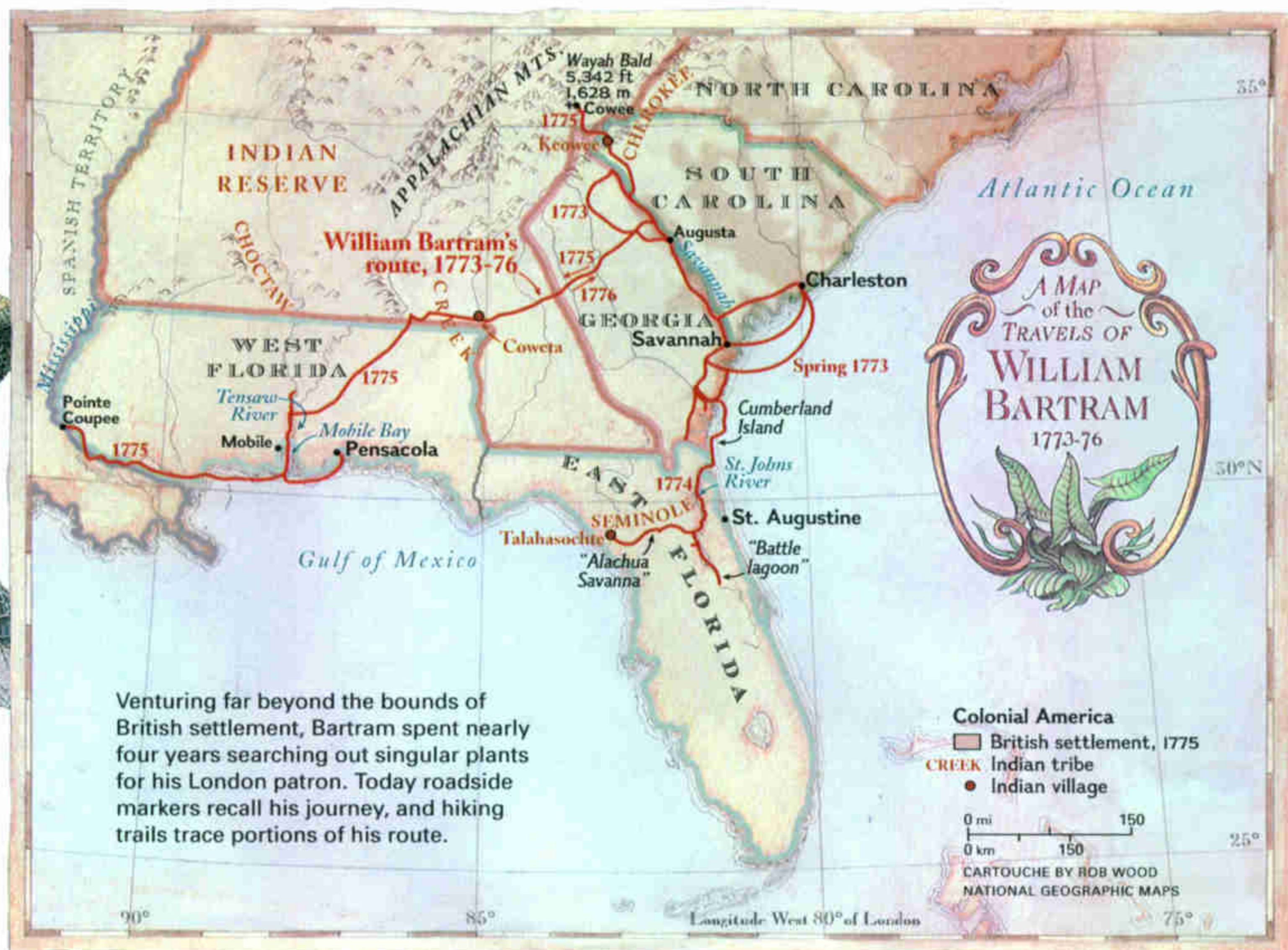
My guide to this most American of American gardens was Robert Peck, a fellow of the Academy of Natural Sciences in Philadelphia. After strolling among beds of wildflowers and along footpaths shaded by grand trees—much of the original garden now looks like an overgrown



Called Puc

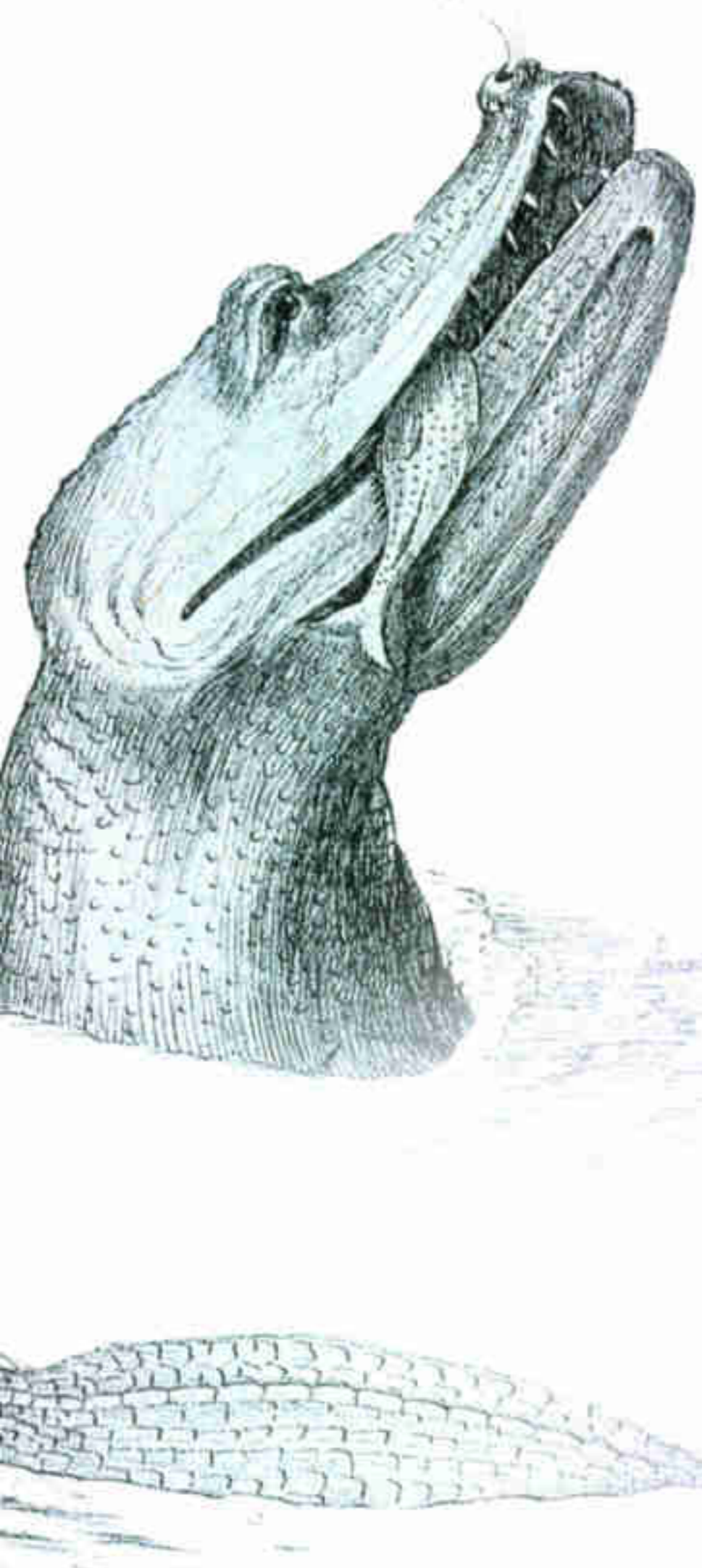
*Puggy, Flower Hunter,
by the Seminole,
Bartram wandered
wide-eyed across
the colonial frontier,
cataloging a land
as magical as a
Franklin tree flower,
as menacing as feed-
ing alligators.*





Venturing far beyond the bounds of British settlement, Bartram spent nearly four years searching out singular plants for his London patron. Today roadside markers recall his journey, and hiking trails trace portions of his route.

NATURAL HISTORY MUSEUM, LONDON (LEFT AND BOTTOM)



arboretum—we stepped inside the restored stone house where William, the seventh of eleven children, was born in April 1739.

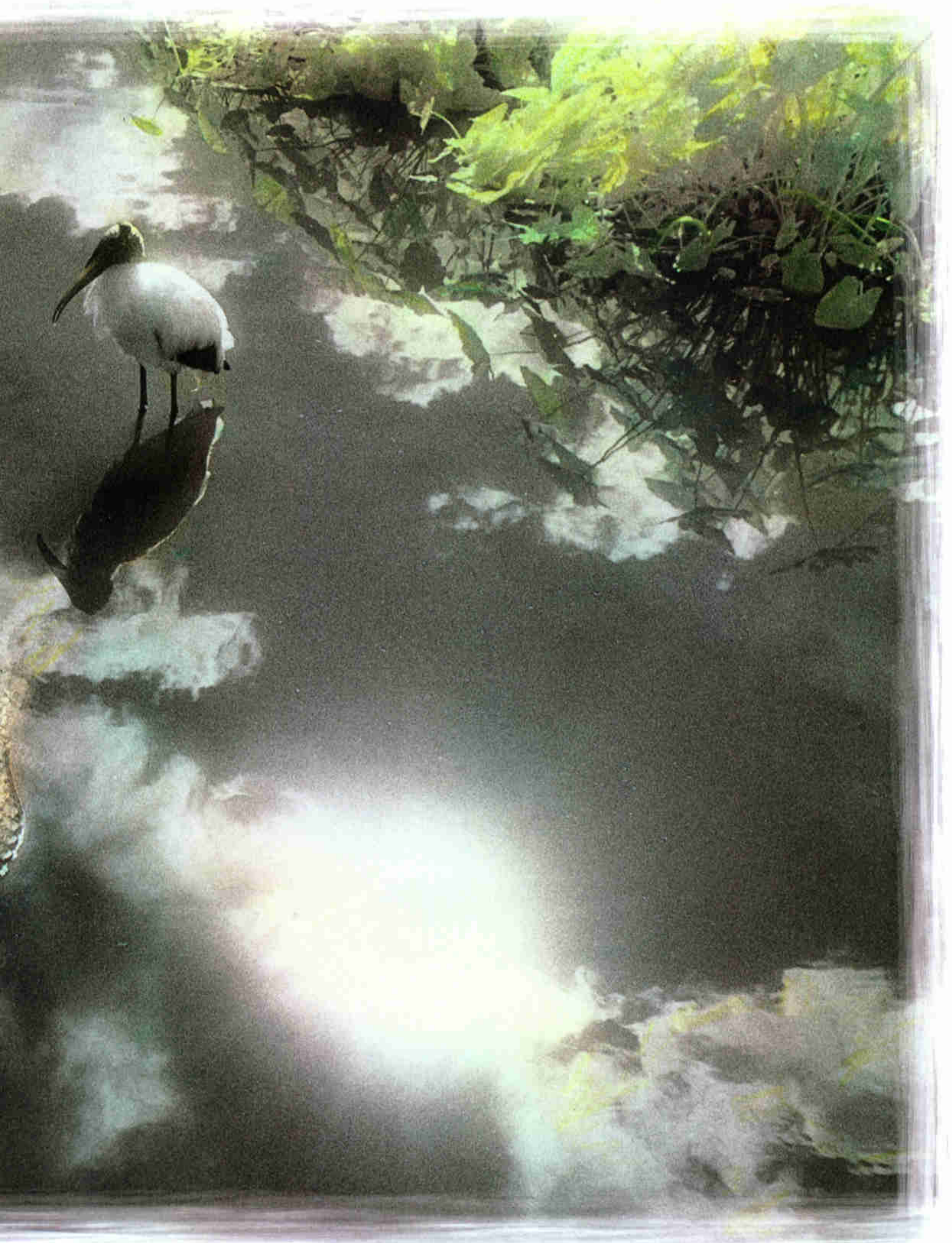
“This must have been an exciting place to grow up, the nerve center of natural history in America,” Peck mused as we walked through rooms furnished in simple Quaker fashion. William’s father was in the business of supplying American plants to the great gardens of England, where well-to-do enthusiasts vied to be the first to display the latest horticultural novelties. As William helped prepare specimens and pack shipping crates, he soon caught his father’s passion for the plant world.

William early on evinced uncommon talent for drawing and painting, and he began accompanying his father on collecting trips at age 12. By 15 he was a budding artist-naturalist. Sensing great promise in his gifted son, John sent him to the Philadelphia Academy, precursor of the University of Pennsylvania. But soon after William completed his schooling, his practical-minded father decided that he should take up a paying trade, and so apprenticed him to a merchant in Philadelphia.

Young Bartram was clearly not cut out for shopkeeping, and for the next ten years misfortune seemed to doom his every endeavor. Little wonder, then, that in the summer of 1765 William jumped at the chance to accompany his father on a scientific survey of Florida, which Britain had recently won from Spain.

The trip took nine months. Losing their way one day in coastal Georgia, father and son stumbled on “severall very curious shrubs.” One of these, which William later named *Franklinia* after his father’s old friend





*S*cientist with a poet's soul, Bartram described a resting wood stork as "melancholy, as if in the deepest thought." The alligator's body, he noted, "is covered with horny plates or squammas, impenetrable . . . even to a rifle ball."

Benjamin Franklin, became the Bartrams' most celebrated find and inspired William's greatest artistic achievement (page 108).

The so-called Franklin tree also became something of a botanical mystery when it vanished from the Georgia site in the 19th century—some blame overzealous collectors—and it has never been found growing in the wild anywhere else. Seeds collected by William saved the species from extinction.

Over the course of the expedition William became enamored with the wide-open possibilities of the frontier. Unwilling to return to his ill-fitting life as a merchant, he determined to carve an indigo plantation from the Florida wilderness. This “frolic,” as his father called it in protest, soon devolved into an all-out fiasco. After sweating out a torrid summer and surviving a shipwreck near today's Daytona Beach, William hightailed it back to Philadelphia in 1767.

He spent the next five years at loose ends, eventually ending up at an uncle's plantation in North Carolina. It was there in 1772 that Bartram faced reality: He was now 33 years old, jobless, wifeless, rootless. His life amounted to a string of misfires. So now, he wrote his parents,

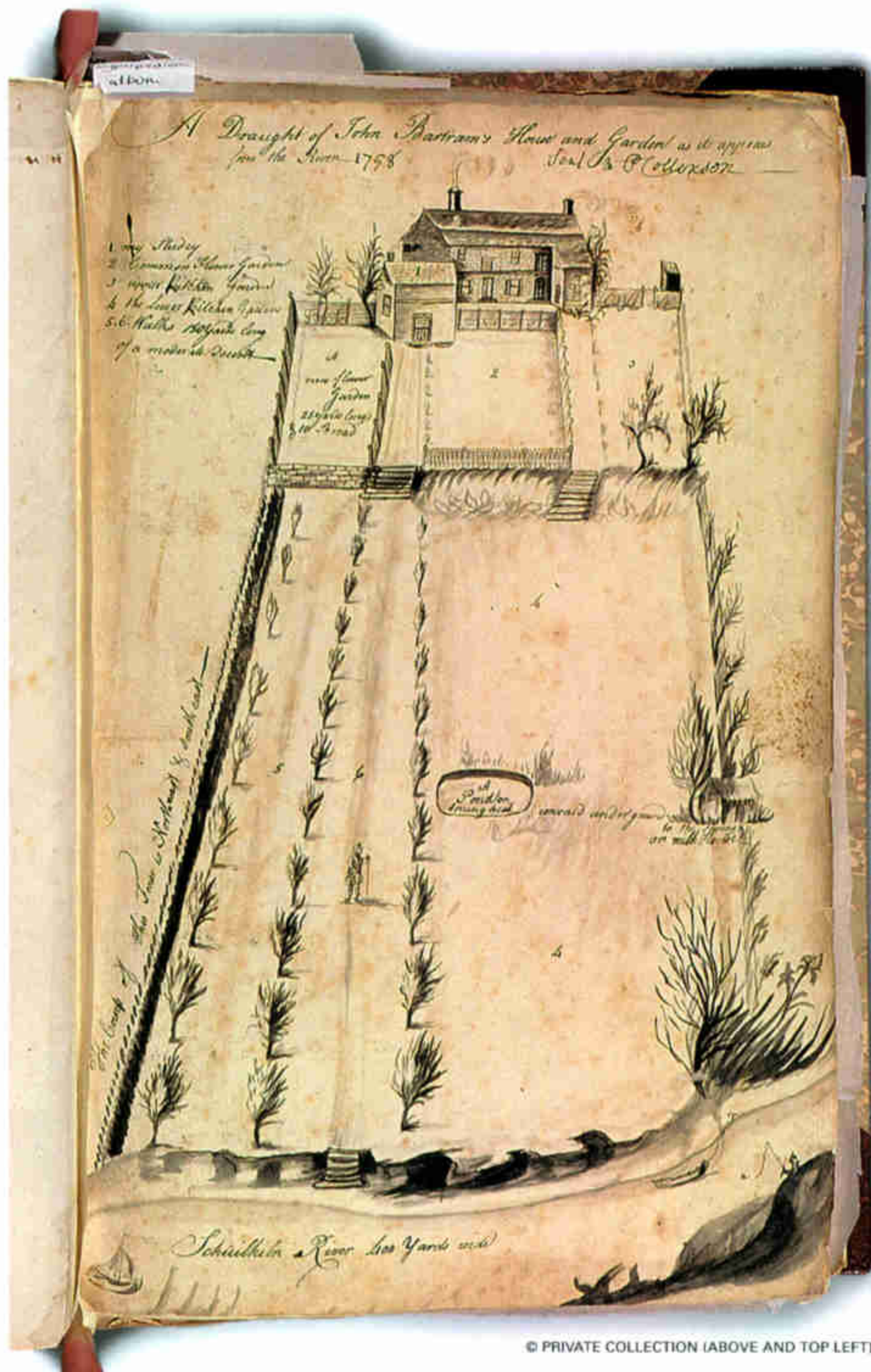


“Botany & drawing are his darling delight,” wrote William’s father of his precocious “Billy,” who drew this sanderling and shells during his teens, as well as a bird’s-eye view of his father’s botanical garden.

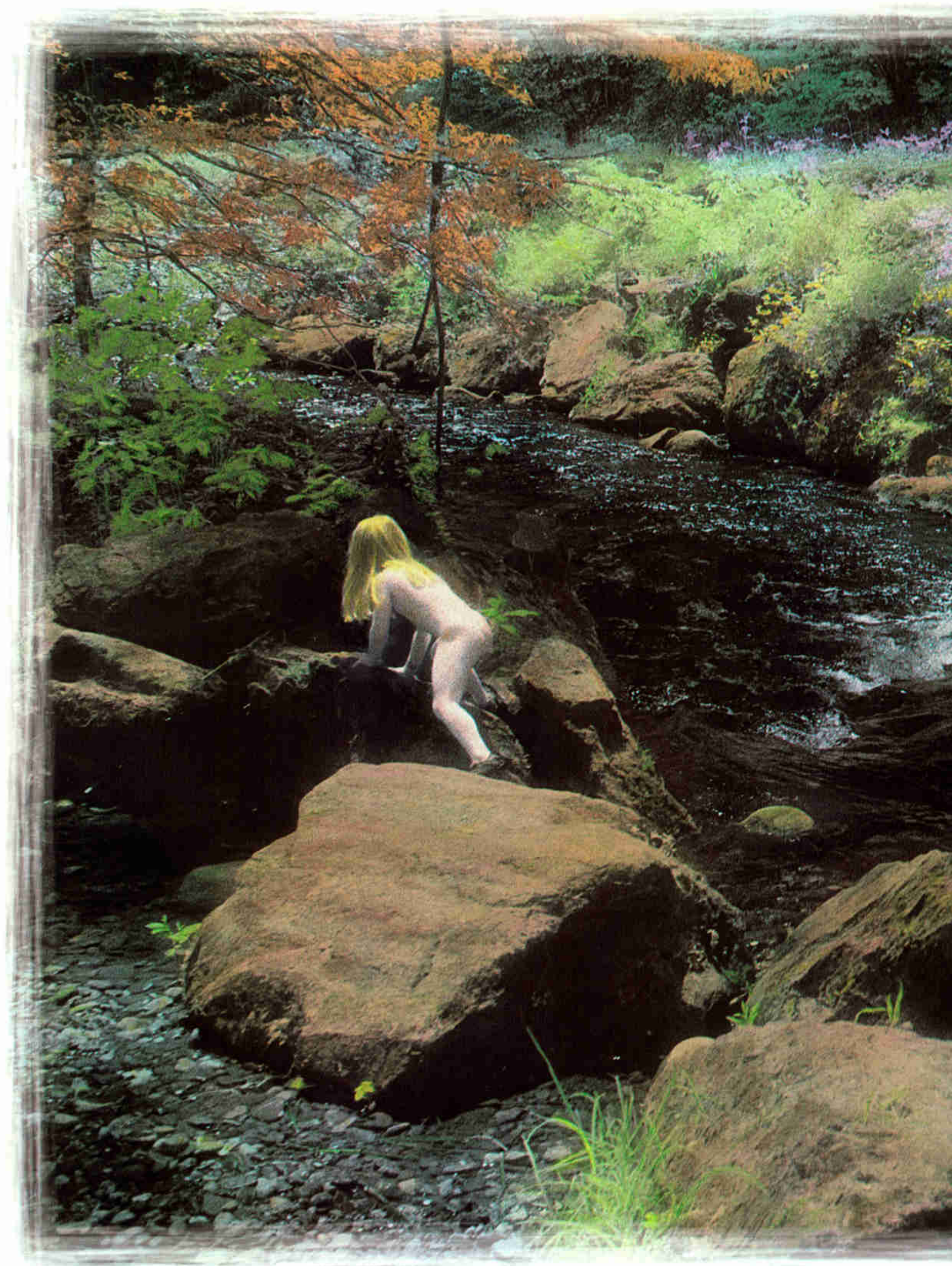
“I determine to retreat within myself to the only business I was born for, and which I am only good for.” William was planning to return to Florida to draw and study nature—much to his father’s vexation.

Not to be dissuaded, William wrote to one of his father’s wealthy clients, the generous Dr. John Fothergill, owner of one of the grandest gardens in all England and a connoisseur of natural history illustration. Would he be interested in sponsoring William on a plant-collecting expedition to Florida, that great hothouse of exotic flora? Already an admirer of Bartram’s artwork, Fothergill agreed. At last the struggling artist-naturalist could follow his bliss.

BARTRAM’S FOUR-YEAR ODYSSEY through the southern frontier began in Charleston, South Carolina, where he landed on the brink of spring in 1773. He followed the Savannah River to Augusta, Georgia, then a hub of the Indian trade, to witness a “great congress” of colonial and Creek and Cherokee leaders. The Cherokee had run up ruinous bills with British traders, and now the only way for them to settle their accounts was to



© PRIVATE COLLECTION (ABOVE AND TOP LEFT)





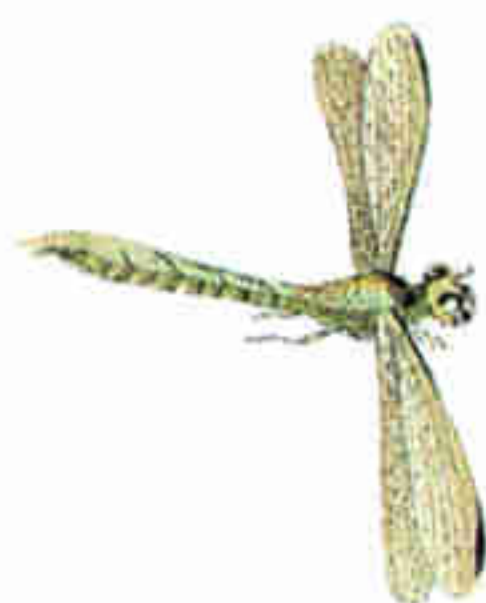
“The sylvan scene of primitive innocence was enchanting,” Bartram wrote after happening on a party of Cherokee “nymphs” cooling off in a stream. Bartram portrayed Indians as children of nature uncorrupted by civilization.

sign away some two million acres of prime hunting ground in eastern Georgia. Once the treaty had been signed, Bartram joined a survey party sent out to blaze the boundaries of the ceded lands. What he saw in that virgin country made him worry that nobody would believe his report: Giant oak, beech, and sweet gum trees rose “like superb columns” in what Bartram declared “the most magnificent forest I had ever seen.”

Unrest among the Indians and a bout of illness prevented his reaching Florida for a time, so Bartram spent most of his first year afield exploring Georgia’s barrier islands and black-water rivers. Plunging into the backcountry for months at a time, he would surface in a port town long enough to ship his discoveries to England, then plunge again into the green unknown.

Bartram realized his dream of returning to Florida in the spring of 1774. Taking a canoe up the St. Johns River, the botanist marveled at magnolia blossoms as big as dinner plates and cypress trees so immense that several men might hide between the buttresses girding the trunks. Bartram also wondered at river-making springs welling up from mysterious limestone caverns. Their water was so transparent that it seemed “you may without the least difficulty touch any one of the fish, or put your finger upon the crocodile’s eye, when it really is twenty or thirty feet under water.”

Like others of his day, Bartram used the terms crocodile and alligator interchangeably. As for putting his finger upon one of those cold, reptilian eyes, he very nearly got the chance.



Extolling the “large sweet-scented” flower of the American lotus (right), Bartram drew its seedpod in an eclectic tableau that reflects his curiosity in all things natural.



“YESSIR, THIS IS THE PLACE ALL RIGHT,” Clay Henderson declared firmly, as if he were announcing a verdict. An attorney who long headed Florida’s Audubon Society, Henderson was taking me on a boat tour of an especially wild and scenic stretch of the St. Johns River.

Now he was pointing out the very spot, called Battle lagoon by Bartram, where the explorer claimed he came within an eyelash of dying when a flotilla of alligators assailed his canoe as he was fishing for supper.

“I was attacked on all sides,” he later wrote. “I expected every moment to be dragged out of the boat and instantly devoured.” Bartram managed to club off his attackers and make it back to shore, where he spent the most harrowing night of his life listening to the frenzied reptiles devour great schools of fish crowding their way downriver.

As daylight drained from the sky, Henderson and I dropped anchor in the middle of Battle lagoon and waited for the alligators. But except for the occasional bellow of a big bull gator the night remained peaceful, and we fell to talking about whether Bartram may have embroidered fact with fiction to spice up his story.

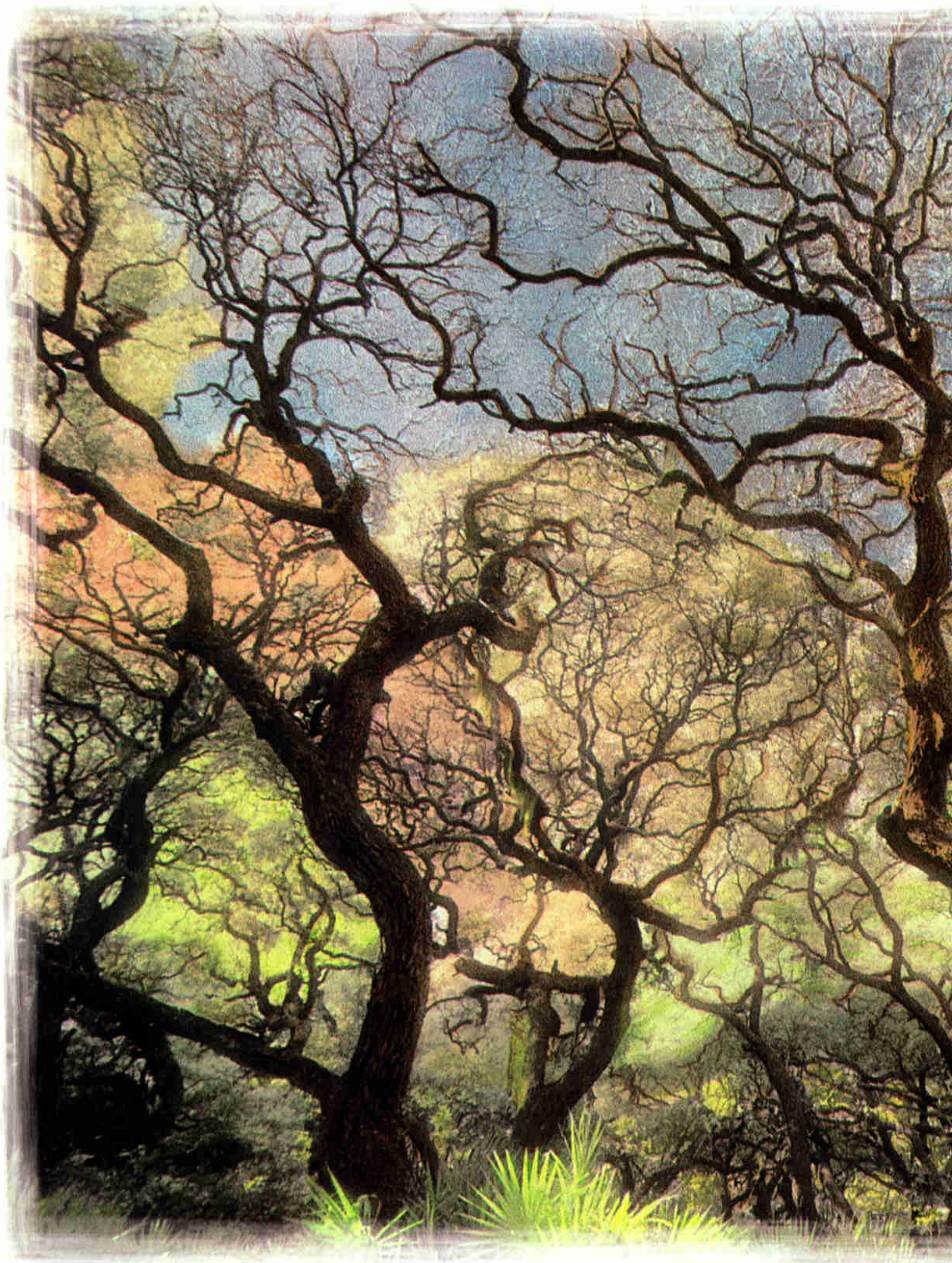
“When Audubon came up the St. Johns in 1832, he used *Travels* as a guidebook,” Henderson said. “Audubon claimed Bartram got it all wrong. Said his own account of Florida would definitely not square with what he called the ‘flowery sayings’ of Mr. Bartram the botanist.”

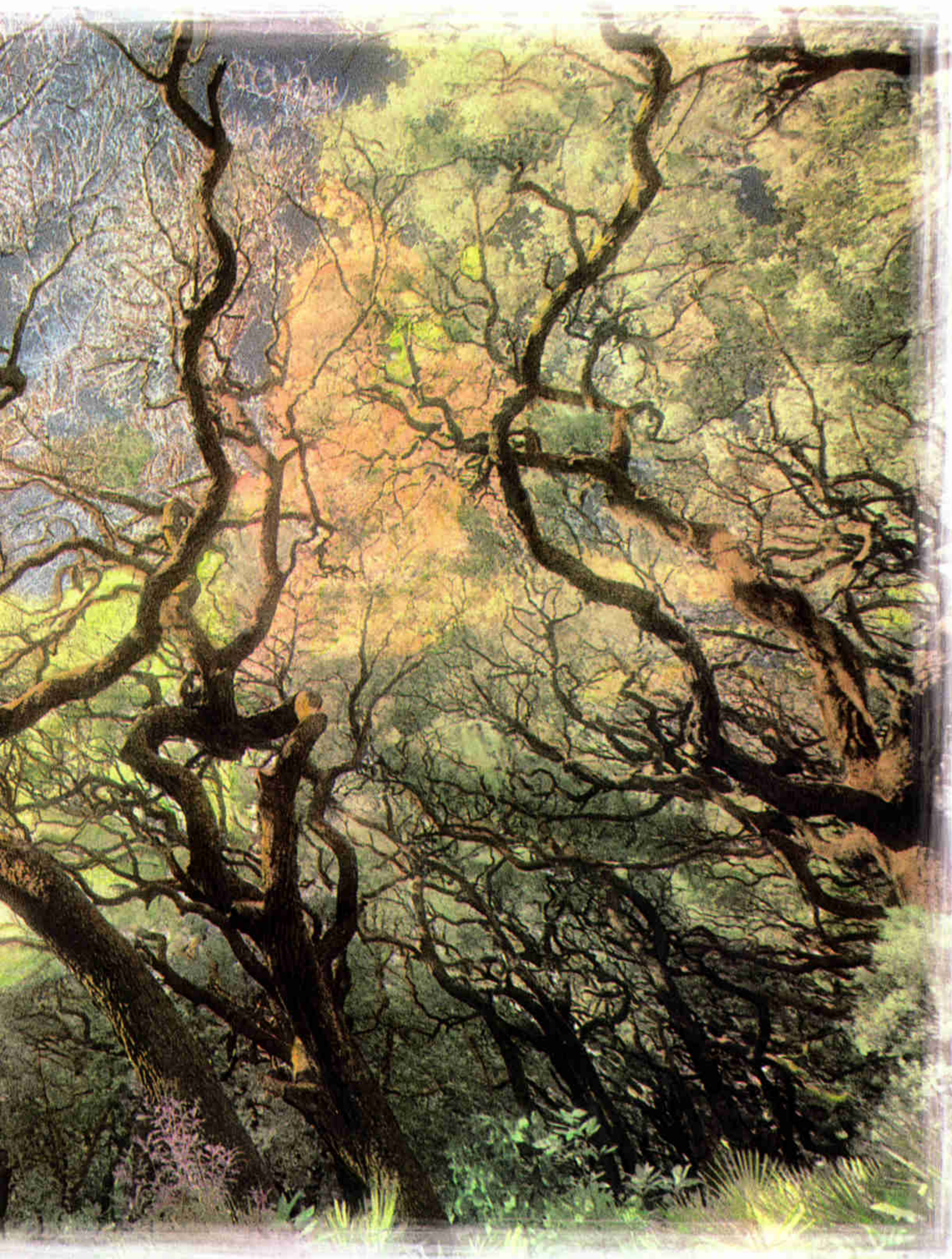
But Audubon was in the minority, Henderson acknowledged. Most naturalists who retraced Bartram’s track validated his descriptions. And while Henderson wasn’t about to bite the hand that once fed him, I suspected that he sided with the “flowery sayings” of Bartram. The proof may be in the middle name Henderson chose for his own son—Craig Bartram Henderson.

Bartram saw beauty in places that left others unimpressed. He also found much to admire in the native peoples most colonists disdained.

“Bartram never met an Indian he didn’t like,” says Edward Cashin, a Georgia historian and one of Bartram’s latest biographers. “He viewed







*L*ifting arthritic arms, live oaks such as these on Georgia's Cumberland Island astonished Bartram. "I have stepped above fifty paces on a strait line from the trunk of one of these trees to the extremity of the limbs."

Indians as the human component of the natural world he loved.”

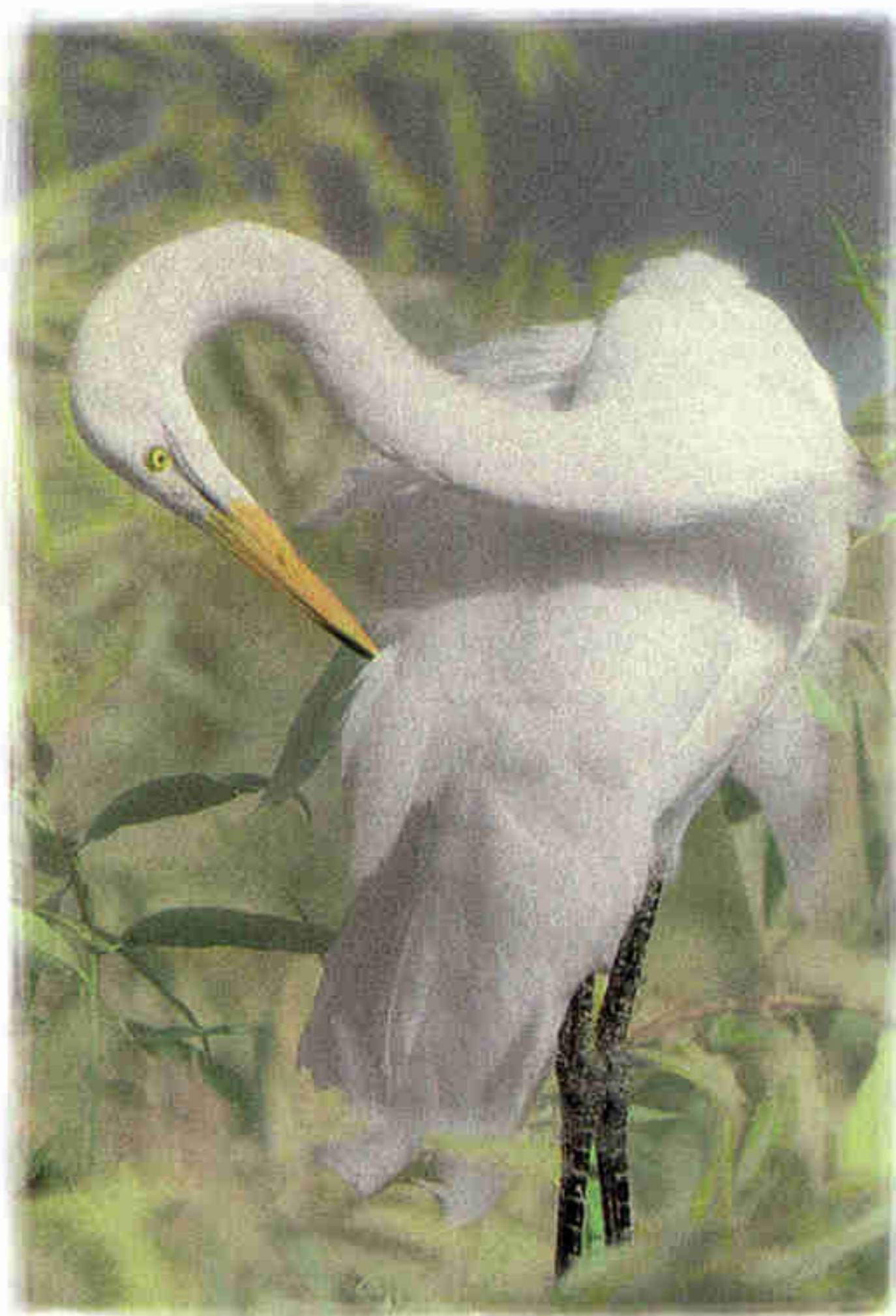
During his far-ranging expeditions into the backcountry Bartram gained firsthand knowledge of southeastern Indian societies, observing their dances, attending their councils, and partaking of their mysterious ceremonial “black drink,” brewed from the yaupon holly. After learning of Bartram’s peaceful mission, Cowkeeper, headman of Florida’s Alachua Seminole, granted the botanist free run of the tribe’s territory and bestowed on him the Indian name Puc Puggy, Flower Hunter.

At the heart of Cowkeeper’s domain lay the “great Alachua Savanna,” a patchwork of pond, marsh, and meadow where the Seminole had taken to running scrub cattle left by Spanish colonists. Situated on the outskirts of today’s Gainesville, the savanna is now a sanctuary called Paynes Prairie State Preserve. Bartram described everything he saw here in such vivid detail that land managers are using his writings as an instruction manual for restoring the savanna to its former glory.

“Around here we call him Bill,” said Jim Weimer, a biologist with the Florida Park Service, custodian of the 21,000-acre preserve. “Bartram gives us the earliest picture of this landscape and its inhabitants. His writings are the nearest thing we have to a time machine.”

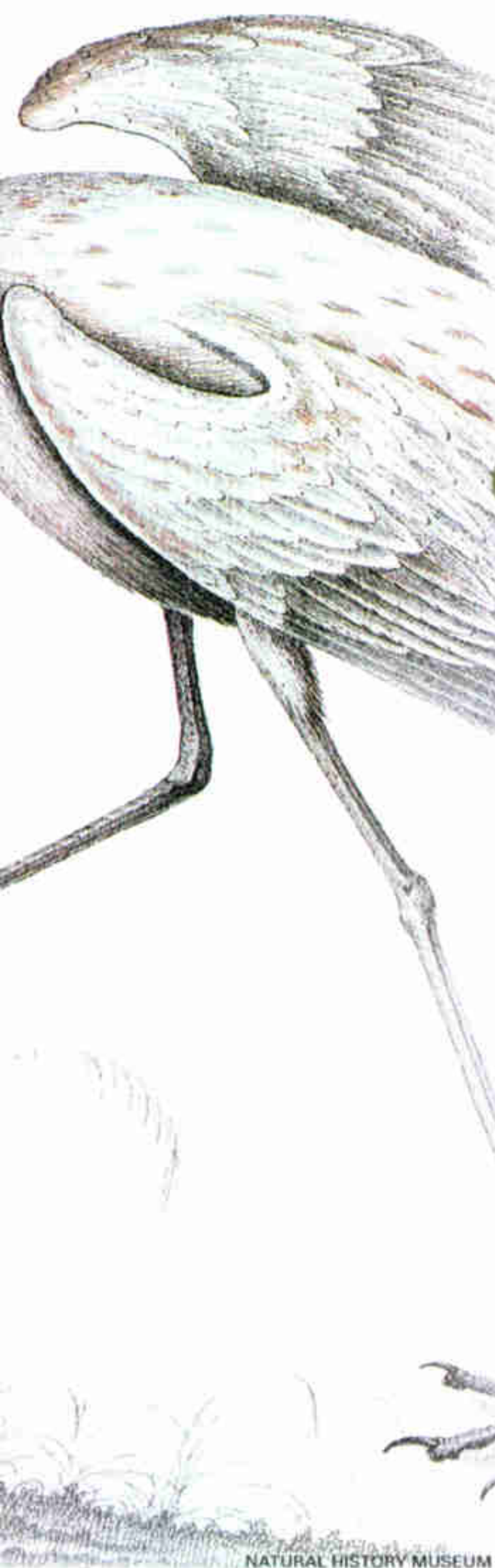
The age-old summits of southern Appalachia offer a form of time travel to the multitudes who retreat to these misty hills to get a breather from modernity. In the spring of 1775 Bartram braved beastly weather and punishing trading paths for the chance to sample the floral richness of this flower hunter’s paradise. Nowadays hard-core hikers can walk in Bartram’s boot tracks along a national recreation trail notched into the Nantahala National Forest. The idea of building a footpath in Bartram’s honor grew out of the hoopla surrounding the nation’s bicentennial in 1976. The 80-mile-long portion in North Carolina was completed in 1997, thanks in large measure to the energetic leadership of a literary-minded ex-marine named Burt Kornegay, owner of Slickrock Expeditions in Cullowhee and a past president of the North Carolina Bartram Trail Society.

On a morning full of May, Kornegay and I, along with botanist Dan Pittillo, picked up Bartram’s path atop the windblown summit of Wayah Bald, a mile-high eminence with grandstand views of the surrounding countryside. Hardly a cloud flecked the blue sky, but close to earth a smother of milky haze obscured all but the nearest mountains.



Bartram

drew this sandhill crane—a first for science—then ate it for dinner. The great egret is one of 215 species in Bartram’s catalog of American birds, the most complete from the period.



NATURAL HISTORY MUSEUM

“Seventy percent of the haze you see out there is caused by air pollution,” Kornegay said, indignation in his voice. “Without it we’d be able to see clear to the Great Smokies, 50 miles off.” Instead we could barely make out the Cheoahs, ten miles away.

When Bartram stopped to rest on top of this bald—“or another nearby, we can’t know for sure,” Kornegay said—he saw ranks of mountains stretching to infinity. Pulling a dog-eared copy of *Travels* from his backpack, Kornegay found the familiar passage and intoned the words the way a priest recites a liturgy:

I began again to ascend the Jore [Nantahala] mountains, which I at length accomplished, and rested on the most elevated peak; from whence I beheld with rapture and astonishment a sublimely awful scene of power and magnificence, a world of mountains piled upon mountains.

Astonished as he was by the far-flung vistas, it was the feast of plant life here that overawed Bartram, especially the forests. By today’s shrunken standards many of the oaks and hickories, poplars and pines growing along the Bartram Trail could in fairness be called big. But compared with the giants Bartram saw, they’re mere saplings. To behold trees on the same scale as those described in *Travels*, the three of us made our way to the Joyce Kilmer Memorial Forest, a relict of that original Appalachian forest that boggled Bartram’s mind.

Craning our necks at Kilmer’s old hemlocks and virgin poplars, each standing distinct and apart with an air of dignified reserve, Kornegay observed that the biggest and oldest trees all had well-worn paths leading to their bases. “Like shrines,” he remarked.

BARTRAM NEVER SAW that grove of sacred trees. For reasons not entirely clear, the botanist cut short his tour of Cherokee country during the last days of May 1775. Perhaps news of the newborn American Revolution finally reached him, along with rumors that the British planned to incite their Cherokee allies to attack the rebel colonies. Whatever the reason, Bartram decided to fall in with a company of Indian traders and head for Mobile in the colony of West Florida. And from there he planned to push on to the Mississippi River, the western limit of British America.

Bartram’s eight-month-long, 1,200-mile trek to the Mississippi and back netted important discoveries—including a yellow-blossomed evening primrose (page 107)—and very nearly cost the discoverer his life. After a fruitful canoe voyage up the Tensaw River north of Mobile Bay, Bartram was hammered by a mysterious malady that laid him up for more than a month and left his eyesight permanently impaired.

When Bartram arrived back in Savannah, Georgia, early in 1776, British warships lay off the coast, and slaves were digging entrenchments around the panicked town. Though the peace-loving Quaker makes no mention of the Revolution in his book, other writings seem to indicate that he served in the Georgia militia for a short time. In any event, by year’s end Bartram was headed home to Pennsylvania.

He arrived at his father’s house in the dead of winter and under the shadow of a war that severed all ties with England and dashed all

prospect of further patronage from Dr. Fothergill. Eight months after William's return his father died, leaving the house and botanical garden to William's younger, more business-minded brother, John Jr.

Not quite 38 when he returned from his travels, Bartram spent the remaining 46 years of his life close to home, painting and writing, helping tend the botanical garden, and studying nature in his own backyard. He kept careful records of weather and the seasonal movements of birds and became a pioneer in the study of avian migration. Bartram also illustrated America's first botany textbook (Lewis and Clark took a copy along to consult during their explorations) and wrote a handful of articles and essays on subjects ranging from the need for a more humane Indian policy to the antics of his pet crow, Tom. The bird, Bartram noted, took "great pleasure and amusement in seeing me write, and would attempt to take the pen out of my hand, and my spectacles from my nose."

Bartram spent almost 15 years reworking his journals and finding the nerve to tell his epic story. When *Travels* finally appeared in 1791, reviewers rolled their eyes at his high-flown prose and sneered at his rosy, almost dewy-eyed view of Indians.

Travels fared much better in Europe. Pirated editions were soon published in English, French, and German, and Bartram found an admiring audience among the Romantic writers. In gloomy England, the warm romance of Bartram's Florida inflamed the imaginations of poets William Wordsworth and Samuel Taylor Coleridge, both of whom mined much raw material from Bartram's book. Echoes of *Travels* are heard again and again in Wordsworth's poem "Ruth" and in Coleridge's "Kubla Khan," most famously in the haunting lines, "Where Alph, the sacred river, ran / Through caverns measureless to man / Down to a sunless sea." Those images are lifted straight from Bartram's account of the "secret subterranean conduits and gloomy vaults" that honeycomb northern Florida's limestone landscape.

Though his book made him little money and his literary merit went largely unappreciated by his countrymen, Bartram did achieve a degree of fame as a master naturalist. A procession of scientific colleagues and aspirants came to his garden, and Bartram shared freely with one and all. Regrettably, many never acknowledged the debt, prompting one observer to write, "Mr. William Bartram has a Library within himself. Some great and famous Botanists have robbed [him] of his Honey, without thanking him for his Trouble." Between 1787 and 1791 no fewer than five botanists scooped Bartram by publishing descriptions of new species he had discovered. Had his specimens not languished in London awaiting identification and naming, his name would be tied to dozens of plant and animal species rather than the handful for which he gets official credit.

Yet even when opportunities to gain some glory fell in his lap, the humble Quaker resolutely shunned the spotlight. In 1782 he was elected professor of botany at the University of the State of Pennsylvania, but he declined.



Keeping his Cherokee heritage alive, artist Davy Arch wears a ceremonial mask he carved. Bartram's Seminole chief recalls a lost America that was "Indian, wild, new, and pleasing."

MORE ON OUR WEBSITE

Visit an online Bartram gallery and learn how the photographs for this article were produced at nationalgeographic.com/ngm/0103.



President Jefferson invited him to serve as naturalist on the 1806 Red River expedition led by Thomas Freeman, but Bartram begged off, citing his poor health. His damaged eyes continued to torment him, and a compound fracture suffered after a fall made walking difficult.

On a summer day in 1823 Bartram, then 84 years old, was walking in his garden when a blood vessel burst in one of his lungs. He died within minutes, cradled in the arms of a relative. "Science has lost one of her brightest ornaments," his obituary announced.

All record and memory of William Bartram's resting place are now lost. Perhaps he was buried in his beloved garden, but more likely he was laid to rest at the Quaker meetinghouse a few miles from his home. In keeping with the Quaker aversion to ostentation, no marker or monument singled him out as someone special. But a fitting epitaph appears in a grateful letter written by Scottish bird artist Alexander Wilson, who readily acknowledged Bartram's profound influence on his life and career. Time spent in the company of that kind old wanderer had sharpened Wilson's eye, and now, he wrote, "I see new beauties in every bird, plant, or flower I contemplate." □

Make no mistake about it,
this is NOT Telluride

81332

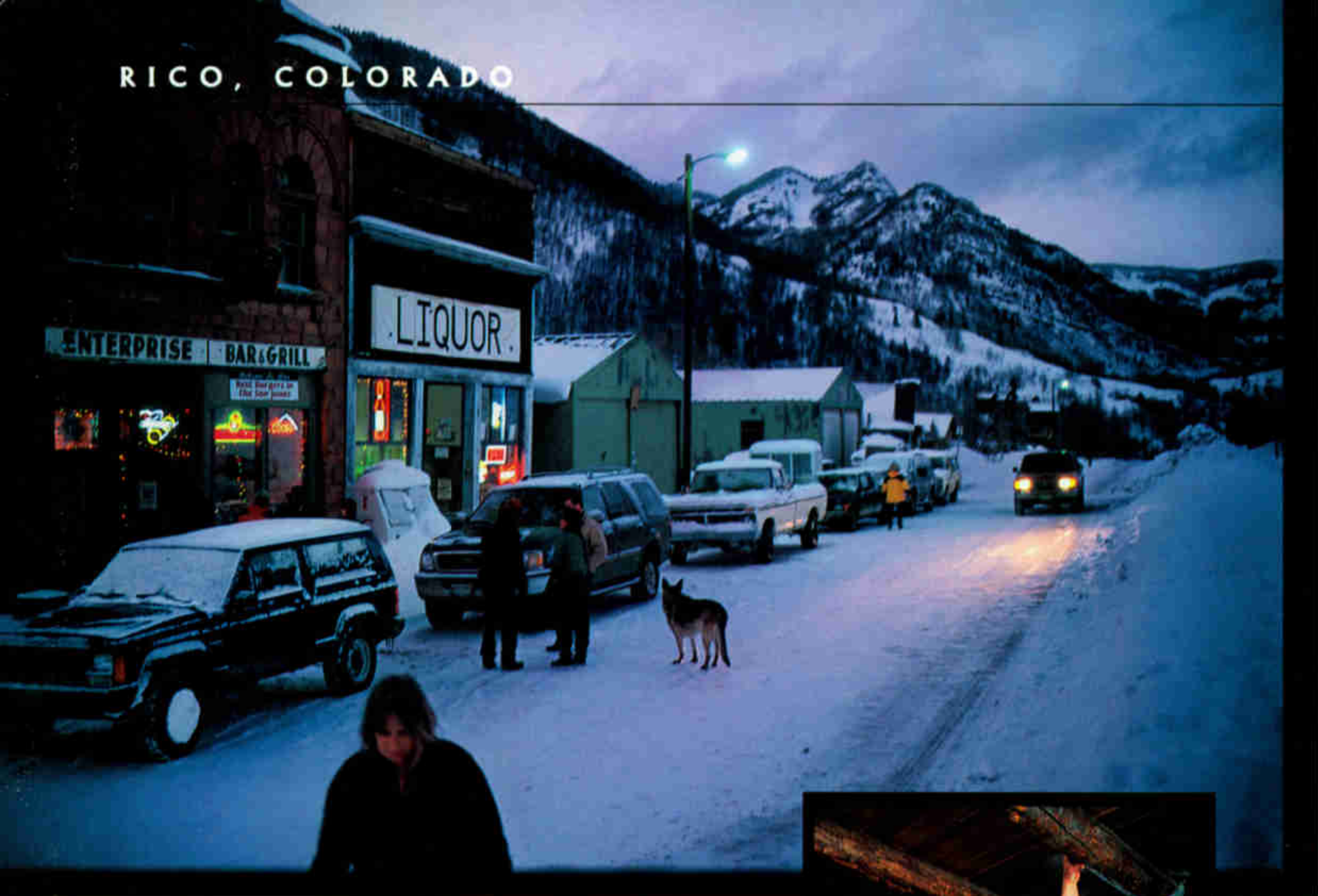
BY CAROL HORNER

PHOTOGRAPHS BY DAVID ALAN HARVEY

The tiny town of Rico, Colorado, lies near the base of Expectation Mountain, rightly so. Born in 1879 as a silver mining camp, Rico, which means “rich” in Spanish, is home to about 140 souls year-round, twice that in summer. It has always been a place of lavish dreams that come and go in a boom-and-bust cycle mimicking the seasons that turn Expectation and other peaks cupping the town from green to gold to white to green again.



Steve Fabian hugs his "guardian angel," June Carter, in the Enterprise Bar & Grill. Rico's century-old watering hole has since shut down, but "It never stays closed too long," Carter says.



With his self-built octagonal cabin and his job at Motherlode Liquor, “Big Jim” Britton likes Rico pretty much the way it is.

It’s bust now, locals agree, but they expect things to change in a Rico kind of way, which means very slowly. If any issue stirs residents these days, it’s development, how much and what kind to allow, if any. In the mid-1990s a handful of investors calling themselves Rico Renaissance came to town, expecting to create a real estate boom like the one in nearby Telluride, which has turned itself into a resort full of condominiums, high-end shops and restaurants, and multimillion-dollar homes. But the developers encountered resistance, and so far almost nothing has happened.

That suits Jim Britton just fine. A gray-bearded man, 6 feet 3 inches tall and over 300 pounds, “Big Jim,” as he’s known, manages Motherlode Liquor on Rico’s main street. He was sitting out front reading a book about Civil War battles when I walked up one afternoon last summer. Drawn to mountain life, Jim, 57, moved west from Ohio soon after college and a stint as a medical supply clerk in the Army. He said he used to enjoy hunting, but now “I guess I have sort of a Bambi complex,” and he has quit cross-country skiing because his knees are messed up. But he has fun playing music with friends; his instrument is a jaw harp.

“My big deal during the summertime is getting my firewood in,” Jim said. He’s a six-cord-a-year man, he told me later as he showed me around his octagonal solar-powered log cabin. He is proud of the house, which he built in 1981 while camping out during the warmer months. “I didn’t have the amount of money to buy a house, probably didn’t even have the credit background for a mortgage.”

He has a propane-powered range and refrigerator and a woodstove he



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Learn to **FLY JETS**.

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Maybe have a couple more kids.
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heats and cooks with in winter. He got rid of his phone a couple of years ago but has a 21-inch television that gets a decent over-the-air signal from NBC and, in daylight hours, from CBS. He thinks he's the last person in Rico without a satellite dish. Jim shares the house with cats Tuxedo and Evander, who has a split ear. Jim is against large-scale growth in Rico but fears he might be outnumbered now.

The Rico Renaissance folks do still hover, hoping to win cooperation, but no one who knows Rico expects it to be transformed anytime soon. Some 8,827 feet high in the San Juan Mountains, this remote town numbered 5,000 in its 1892 heyday and had about 400 residents as late as the early 1950s. It dwindled to double digits after the last mine shut down in 1977 and was pretty much left for dead. Even in midsummer I found only a few businesses operating on the 0.6 of a mile of State Route 145 that doubles as main street. Rico has no school, no doctor, no drugstore or grocery store, no local police. But in the past decade, the population has inched up.

Any comeback has been fueled by the high price of life in Telluride, 28 miles to the north. Rico's 33-year-old town manager and attorney, Eric Heil, said he saw the middle class, including himself, pushed out of there by the cost of housing. In Rico the consensus favors planned growth. "We just want to grow into a functioning town," he said.

You can't hold much of a conversation with anyone in Rico without Telluride being brought up as what they *don't* want to become. They shudder at being called a bedroom community for their pricey neighbor, but they admit that a lot of Rico people work in Telluride, often in construction, or have spouses who work there.

Even some who stand to make more money if Rico gets bigger are cautious about change. "The smallness and intimacy of this community is why we're here," said Brigitte Wilson, behind the counter of her gift shop, Mountain Mama's Trading Co. "If you lose that closeness, you lose that feeling of being part of a family."

"We are so rural we're termed 'Frontier Medicine,' says Scott Chandler, giving a practice IV at the fire station.



Denver

Rico

81332

POPULATION: about 140**POPULATION IN****1892:** 5,000**SELL-OUT CROWD AT RICO****THEATRE AND CAFÉ:** 350**NUMBER OF PAVED****ROADS:** 1**NEAREST TRAFFIC LIGHT:**

50 miles

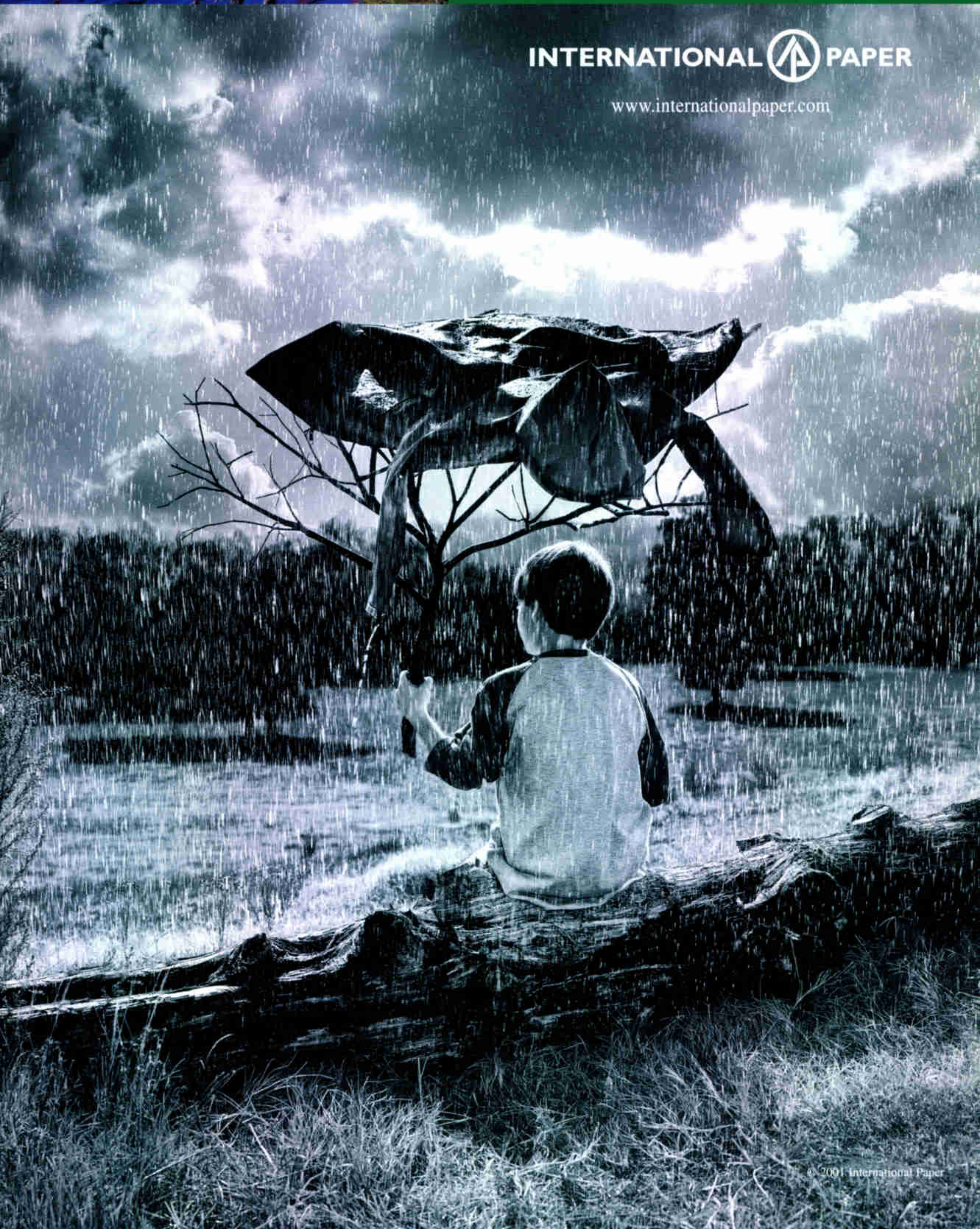
NUMBER OF PLACES**YOU CAN BUY ALCOHOL****(WHEN THE ENTERPRISE****BAR & GRILL ISN'T SHUT****DOWN):** 5**NUMBER OF PLACES****YOU CAN BUY A LOAF OF****BREAD:** 1

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I saw what she meant about family at the monthly town board meeting. The liquor license for the Enterprise Bar & Grill came under challenge, and the town clerk reported that the bar's manager, who didn't show up at the meeting, was about \$800 behind in water bills. The Enterprise is one of only two watering holes in town. It has a more frontier-like atmosphere than the Rico Theatre and Café, lending credence to rumors that a couple of women had once danced topless on the bar. Referring to the manager by his first name, board members wrestled with whether to shut down his operation. They talked about the chances he'd been given and would yet be given to make things right. But they voted to close the bar.

Standing on the steps of town hall after the meeting, Erin Johnson, a Rico Renaissance lawyer who lives in Cortez, said meetings like the one

MORE INFORMATION

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Even on his days off, fly-fishing guide Dave Hill takes to the river. "If a person's into glitz, Rico's not for them."

we just sat through—"too informal, too uninformed"—would eventually be a thing of the past. The developers want to "look at everybody's objectives. This town is gonna absolutely take off as soon as they get a sewer system. It's gonna hit like *that*," Johnson said, snapping her fingers.

As we talked, I could see Eric Heil striding down the hill to have a last beer at the Enterprise and order the place shut down. When word got out, no one seemed too upset. The Enterprise was always opening and closing, they said, and soon enough the manager would recoup or someone else would step forward to run it. □

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Final Edit



INDONESIA

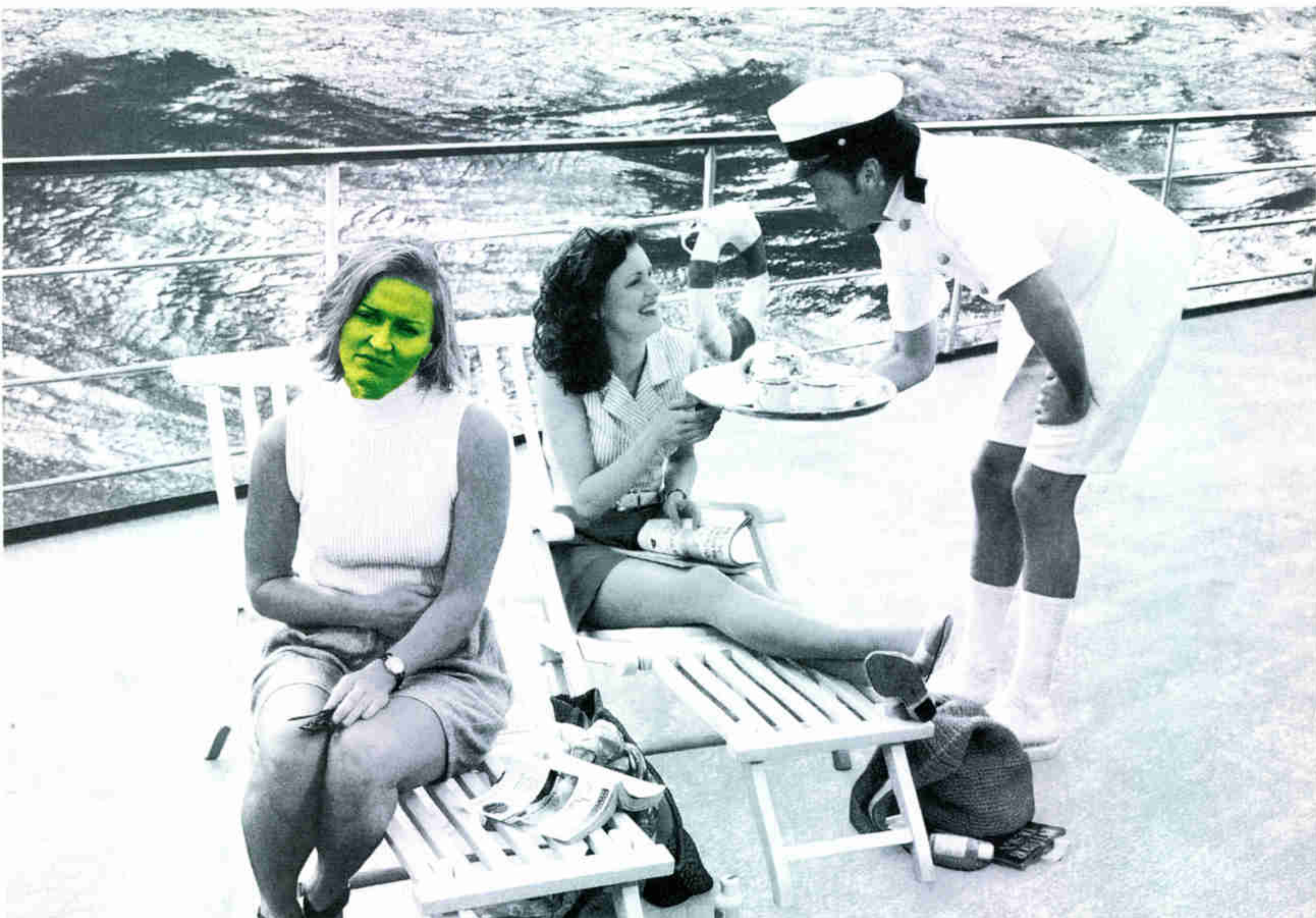
Feast for the Eyes

The late morning light turned harsh as Yali people of highland Irian Jaya prepared a feast, and smoke from roasting pigs and sweet potatoes filled the air. “My only option was to find another kind of light,” says French photojournalist Alexandra Boulat, so she began shooting “through the smoke, against the sun.” When a Yali man with a dramatically pierced nose turned abruptly toward her on a village path, she knew the shot would be a favorite.

Boulat also relished the meal she shared with the Yali, especially the sweet potatoes. “They were really good, and so big.” She credits a strong stomach for some of her success in moving comfortably among Indonesia’s diverse cultures. “I ate with many different people—it’s a way to get in touch with the country and the people you photograph.”

MORE ON OUR WEBSITE

You can send this picture as an electronic greeting card at nationalgeographic.com/ngm/finaledit/0103.



The Transderm Scōp® patch is clinically proven more effective than Dramamine®*



Transderm Scōp is more effective and longer lasting than Dramamine at preventing the nausea and vomiting of motion sickness.** Just peel off the backing and press it behind your ear at least four hours

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In clinical studies, 5 out of 6 people did not report drowsiness with Transderm Scōp.

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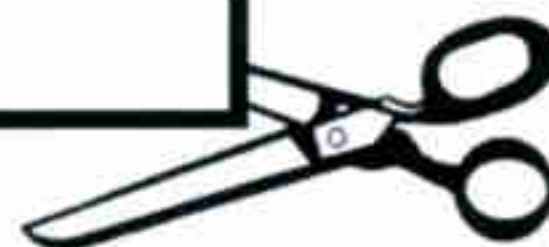
Not for children or those with glaucoma, difficulty in urinating, or an allergy to scopolamine or other belladonna alkaloids. In clinical studies, some side effects were noted, including blurred vision, dryness of the mouth (in two-thirds of users) and drowsiness (reported incidence less than 1 in 6). While using this product, you should not drive, operate dangerous machinery or do other things that require alertness. Avoid using alcohol. If you are elderly, your physician should exercise special care in prescribing this product. See adjoining page for additional information on potential adverse reactions or side effects.

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Brief Summary

(For full prescribing information, see package insert.)

INDICATIONS AND USAGE: Transderm Scop is indicated for prevention of nausea and vomiting associated with motion sickness in adults. The patch should be applied only to skin in the postauricular area.

CONTRAINDICATIONS: Transderm Scop is specifically contraindicated in persons who are hypersensitive to the drug scopolamine or to other belladonna alkaloids, or to any ingredient or component in the formulation or delivery system, or in patients with angle-closure (narrow angle) glaucoma.

WARNINGS: Transderm Scop should not be used in children and should be used with special caution in the elderly. See PRECAUTIONS.

Since drowsiness, disorientation, and confusion may occur with the use of scopolamine, patients should be warned of the possibility and cautioned against engaging in activities that require mental alertness, such as driving a motor vehicle or operating dangerous machinery.

Potentially alarming idiosyncratic reactions may occur with ordinary therapeutic doses of scopolamine.

PRECAUTIONS

General: Scopolamine should be used with caution in patients with pyloric obstruction, or urinary bladder neck obstruction. Caution should be exercised when administering an antiemetic or antimotility drug to patients suspected of having intestinal obstruction.

Transderm Scop should be used with special caution in the elderly or in individuals with impaired metabolic, liver, or kidney functions, because of the increased likelihood of CNS effects.

Caution should be exercised in patients with a history of seizure or psychosis, since scopolamine can potentially aggravate both disorders.

Information for Patients: Since scopolamine can cause temporary dilation of the pupils and blurred vision if it comes in contact with the eyes, patients should be strongly advised to wash their hands thoroughly with soap and water immediately after handling the patch. In addition, it is important that used patches be disposed of properly to avoid contact with children or pets.

Patients should be advised to remove the patch immediately and contact a physician in the unlikely event that they experience symptoms of acute narrow-angle glaucoma (pain in and redness of the eyes accompanied by dilated pupils). Patients should also be instructed to remove the patch if they develop any difficulties in urinating.

Patients should be warned against driving a motor vehicle or operating dangerous machinery while wearing the patch. Patients who engage in these activities should also be aware of the possibility of withdrawal symptoms when the patch is removed. Patients who expect to participate in underwater sports should be cautioned regarding the potentially disorienting effects of scopolamine. A patient brochure is available.

Drug Interactions: Scopolamine should be used with care in patients taking drugs, including alcohol, capable of causing CNS effects. Special attention should be given to drugs having anticholinergic properties, e.g., belladonna alkaloids, antihistamines (including meclizine), and anti-depressants.

Carcinogenesis, Mutagenesis, Impairment of Fertility: No long-term studies in animals have been performed to evaluate carcinogenic potential. Fertility studies were performed in female rats and revealed no evidence of impaired fertility or harm to the fetus due to scopolamine hydrobromide administered by daily subcutaneous injection. In the highest-dose group (plasma level approximately 500 times the level achieved in humans using a transdermal system), reduced maternal body weights were observed.

Pregnancy Category C: Teratogenic studies were performed in pregnant rats and rabbits with scopolamine hydrobromide administered by daily intravenous injection. No adverse effects were recorded in the rats. In the rabbits, the highest dose (plasma level approximately 100 times the level achieved in humans using a transdermal system) of drug administered had a marginal embryotoxic effect. Transderm Scop should be used during pregnancy only if the anticipated benefit justifies the potential risk to the fetus.

Nursing Mothers: It is not known whether scopolamine is excreted in human milk. Because many drugs are excreted in human milk, caution should be exercised when Transderm Scop is administered to a nursing woman.

Pediatric Use: Children are particularly susceptible to the side effects of belladonna alkaloids. Transderm Scop should not be used in children because it is not known whether this system will release an amount of scopolamine that could produce serious adverse effects in children.

ADVERSE REACTIONS: The most frequent adverse reaction to Transderm Scop is dryness of the mouth. This occurs in about two thirds of the people. A less frequent adverse reaction is drowsiness, which occurs in less than one sixth of the people. Transient impairment of eye accommodation, including blurred vision and dilation of the pupils, is also observed.

The following adverse reactions have also been reported on infrequent occasions during the use of Transderm Scop: disorientation; memory disturbances; dizziness; restlessness; hallucinations; confusion; difficulty urinating; rashes and erythema; acute narrow-angle glaucoma; and dry, itchy, or red eyes.

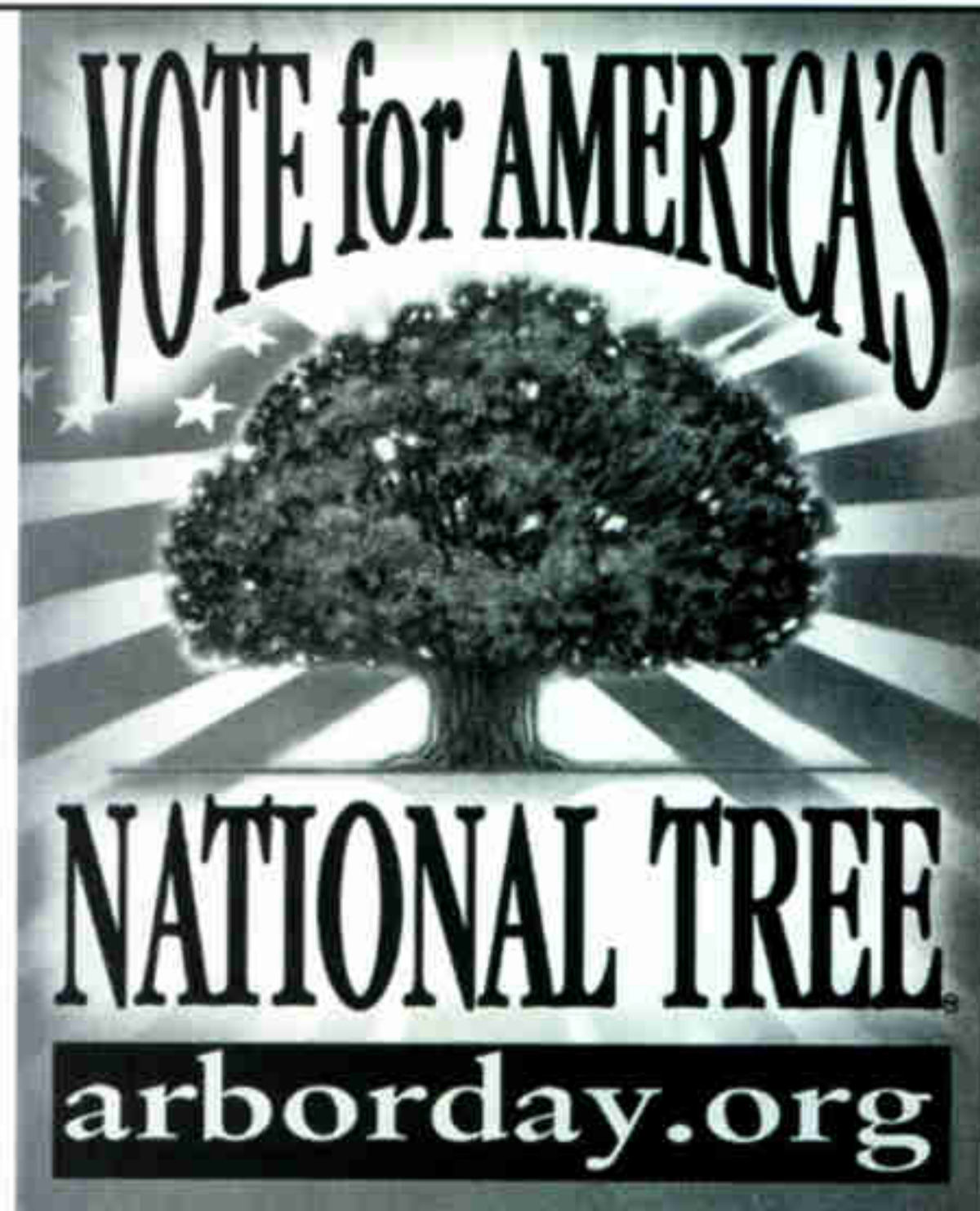
Drug Withdrawal: Symptoms including dizziness, nausea, vomiting, headache, and disturbances of equilibrium have been reported in a few patients following discontinuation of the use of the Transderm Scop system. These symptoms have occurred most often in patients who have used the system for more than three days.

OVERDOSAGE: Overdosage with scopolamine may cause disorientation, memory disturbances, dizziness, restlessness, hallucinations, confusion, psychosis, convulsions, bronchospasm and respiratory depression, and muscular weakness. Should these symptoms occur, the Transderm Scop patch should be removed immediately, adequate hydration should be maintained, and appropriate symptomatic treatment initiated.

CAUTION: Federal law prohibits dispensing without prescription.

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You Can Help Select a National Symbol

Now, for the first time, the Arbor Day Foundation is making it possible for everyone to vote for a national symbol--America's National Tree. Go online now at arborday.org and cast your vote. The voting ends midnight, the day before National Arbor Day, the last Friday in April.

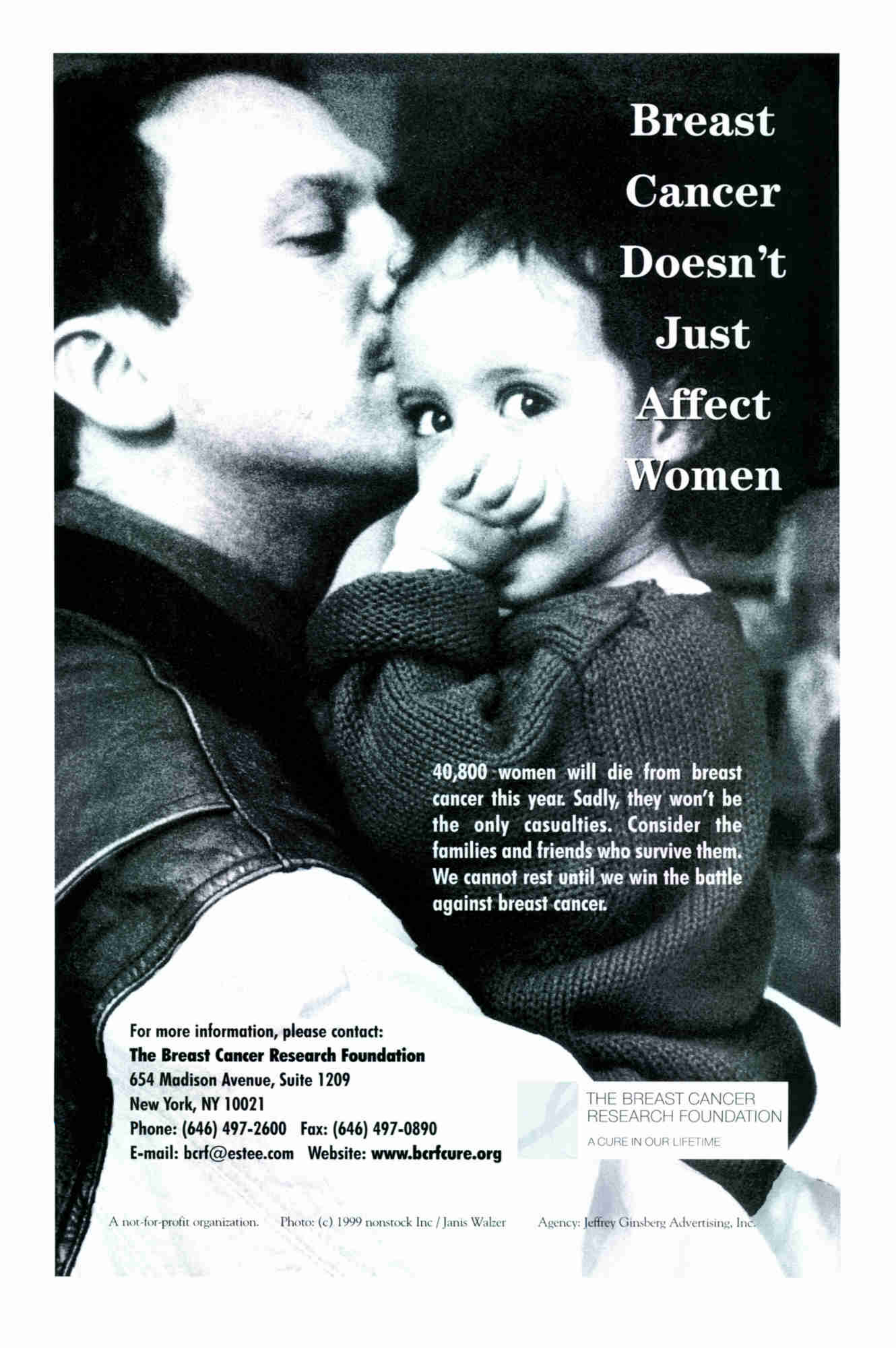
If you don't have Internet access you can write your selection on a three by five card and send it to: National Tree, The National Arbor Day Foundation, Nebraska City, NE 68410.

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C O V E R I N G T H E W O R L D

INDONESIA

Logistical Quagmire

Mountainous terrain, weather, and uncertainty plague a photographer in pursuit of her story

It wasn't easy for **Alexandra Boulat** to reach the highlands of Irian Jaya, where she photographed these members of the Yali tribe roasting a pig during a village celebration. "I got there in a missionary's Cessna, after an hour's flight," she says. "When you land, it's very scary. You come down between mountains, not at an airport but just a field, with barely enough space for the

plane to land. Then it leaves, and there's so much rain that it may not come back when it's supposed to." Luckily the plane returned to pick her up on schedule, three days later.

Indonesia's sheer size posed many logistical problems. And, Alexandra adds, "you always have to consider the weather. You can't control the rain; you either have to manage with it or come back another time."

POINT OF VIEW

Artist at Work



ANNIE GRIFFITHS BELT

Under the watchful eye of her faithful companion, artist **Jill Enfield** hand-colors a black-and-white infrared photograph, one of those she tinted to help create the evocative images that appear in the article on 18th-century artist and botanist William Bartram, photographed by **Annie Griffiths Belt**. “Using infrared film and a dark red filter,” says Annie, “breaks all the rules of standard photography. You need intense, bright light; you work with very slow film; and what you see is not what you get, because the film is sensitive to light that the eye can’t see.” Jill colored the images with oil paint, pastel chalk, and colored pencil, and staff designer **Jen Christiansen** added the distinctive borders.

WORLDWIDE

Photographer **Kenneth Garrett** (below) was working in Alaska when he learned of the discovery of a Moche tomb in Peru. He hopped on a plane in Kotzebue and, after stopping off at his Virginia home “long enough to change clothes,” was at work in Peru within four days. Ken has covered archaeological sites around the world for more than two dozen NATIONAL GEOGRAPHIC articles, seeking “to bring past civilizations to life.”

Longtime Asia hand **Tracy Dahlby** has



been in places with creepy wildlife before. But the cockroaches aboard an Indonesian passenger ship were “truly spectacular,” he says. “The ship pulled out, and it was like somebody set off a cockroach hand grenade—they poured out from everywhere.” In time he came to understand that the insects indicated no lack of dedication on the crew’s part: “They can’t stop for proper cleaning since they’re the taxi service for a hard-pressed island nation. They see it as a social mission. It put my experience in perspective.”

Carol Horner, a confirmed urban dweller and 27-year veteran of eastern big-city newspapers, traveled to Colorado for the first time to “the smallest of small towns”—Rico. “It’s the kind of place you almost imagine wouldn’t exist anymore in this country,” she says. “It’s truly remote.” Carol now directs the University of Maryland’s Knight Center for Specialized Journalism.

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Flashback



NIEUVENHUIS

INDONESIA

Dressed to Kill

When Mabel Cook Cole explored the island of Nias off the coast of Sumatra for a 1931 article, warriors still wore knife sheaths decorated with tiger-tooth amulets. But the rhinoceros-hide armor reported by early travelers was nowhere to be seen. "To-day no large animals exist on the island," Cole wrote, "and the sheets of metal used on the coats of mail are obtained from Chinese traders on the coast." This photograph was never published in the magazine.

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You can send this month's Flashback as an electronic greeting card and access the Flashback photo archives at nationalgeographic.com/ngm/flashback/0103.

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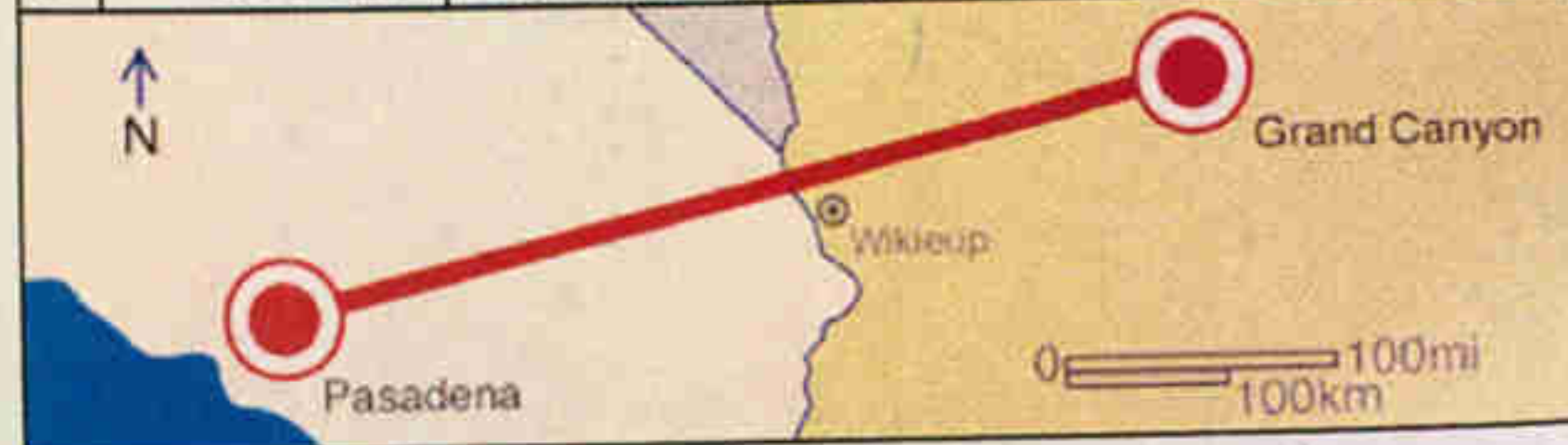
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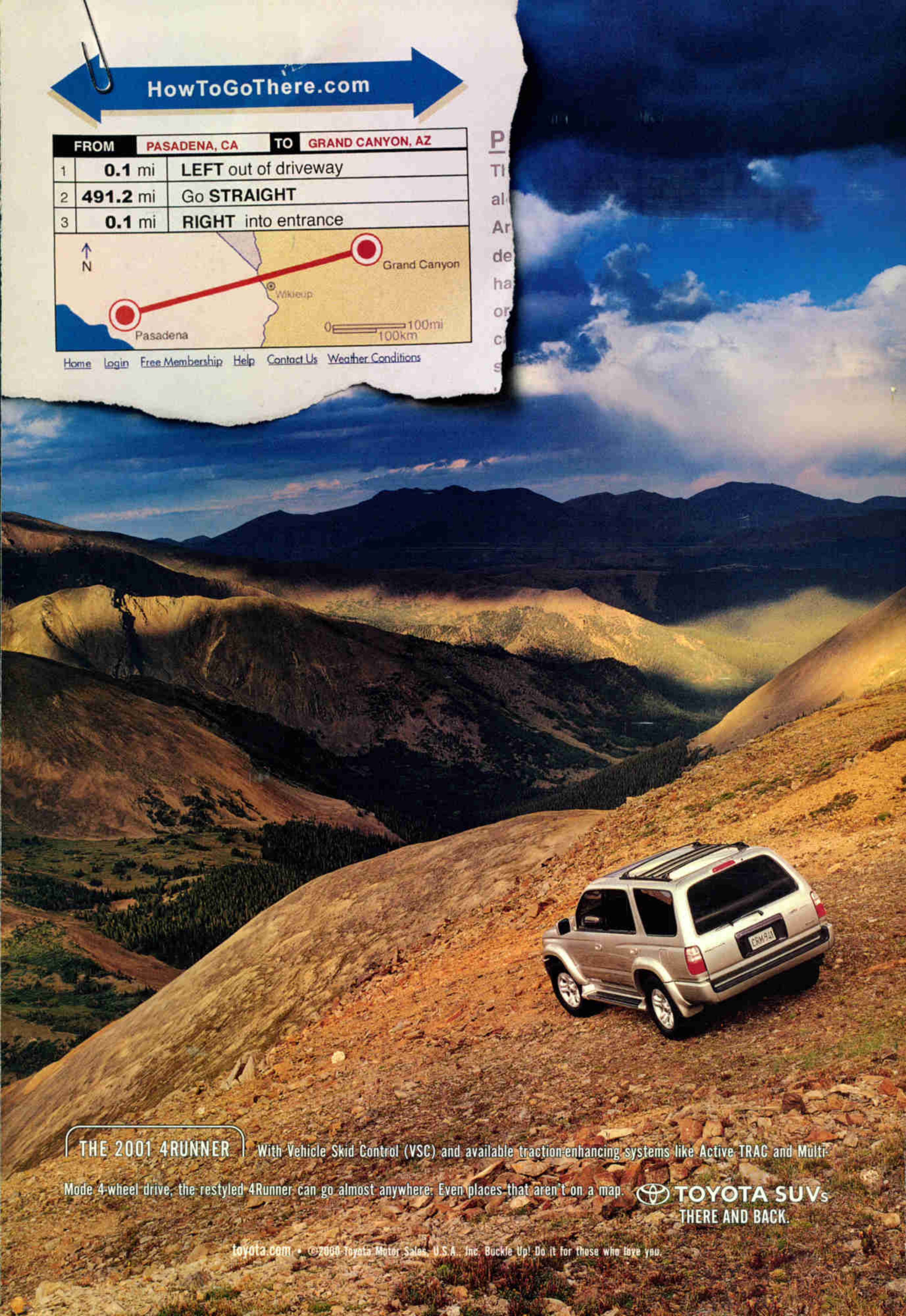


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